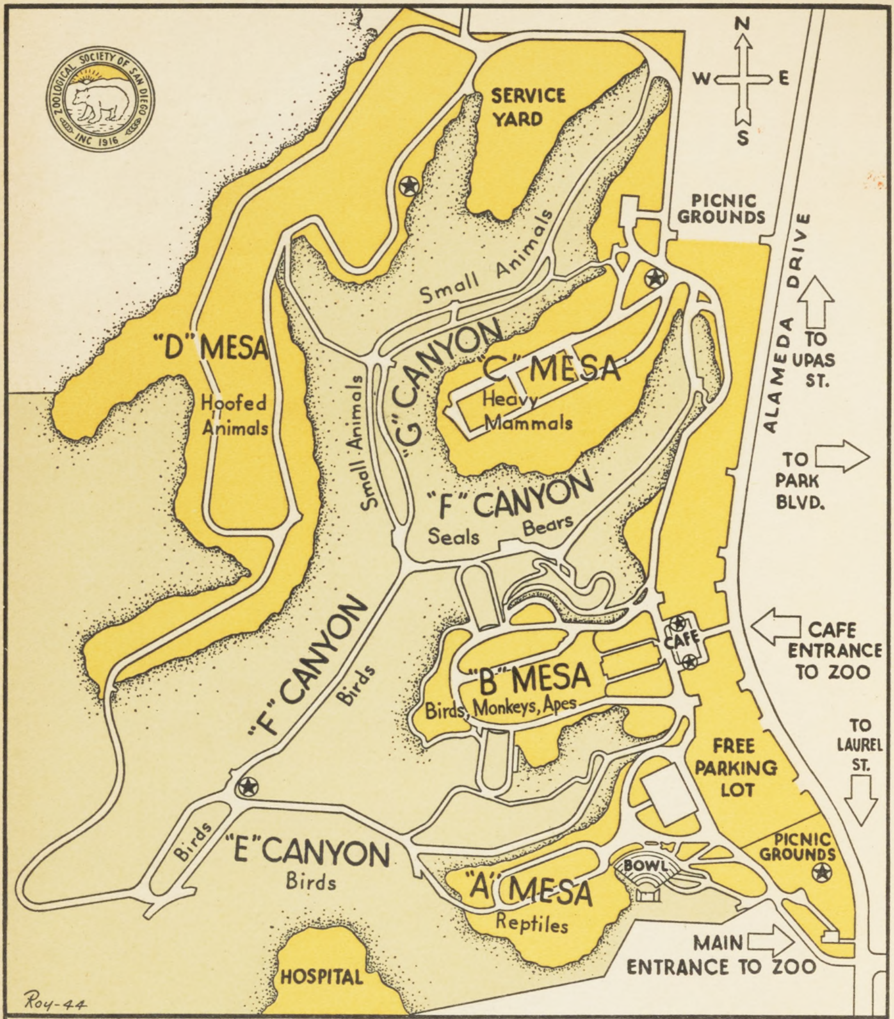
SAN DIEGO ZOO

OFFICIAL GUIDE BOOK · 50c



SKETCH MAP OF

SAN DIEGO ZOOLOGICAL GARDEN

BALBOA PARK

═══ PATHWAYS ARE SHOWN THUS ═══

★ REST ROOMS ARE INDICATED BY STARS ★

"E" CANYON
Cranes, Herons, Ducks
Geese, Swans, Ostriches

"F" CANYON
Bears, Lions, Tigers
Sea Mammals, Large Birds

"G" CANYON
Leopards, pumas, panthers on east and south sides of roadway Small cats, foxes, swine, and canines on north and west sides of roadway

"A" MESA & WEGEFORTH BOWL
Reptiles, Snake House
Turtles, Lizards, Crocodiles

"B" MESA
Primates, Cage Birds
Monkeys, Apes, Baboons

"C" MESA
Elephants, Giraffes, Tapirs
Hippopotamuses, Rhinos

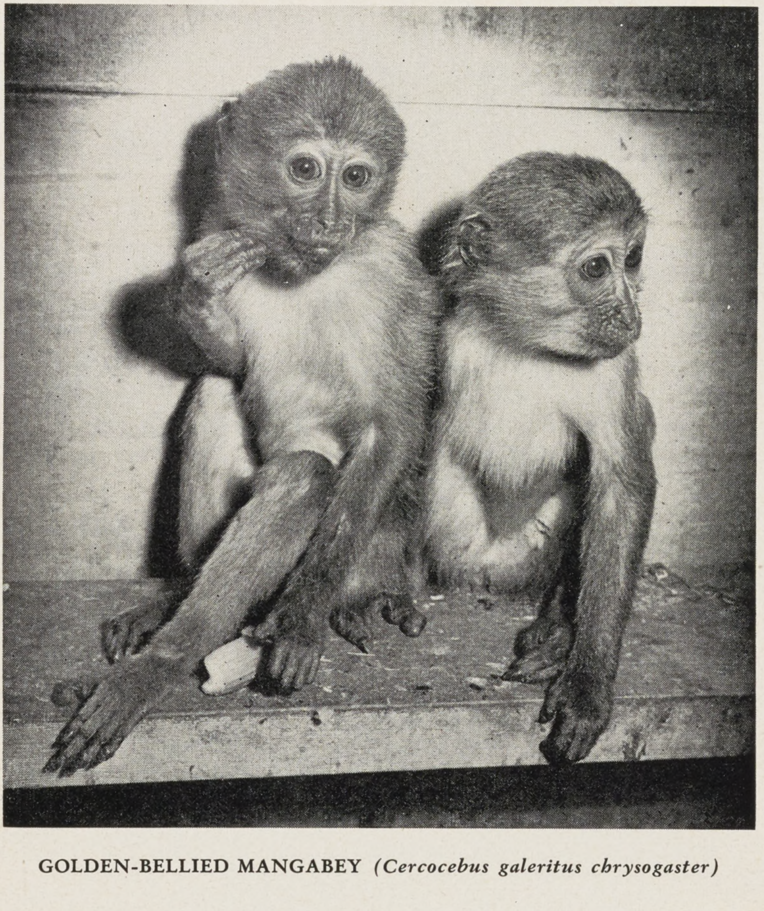
"D" MESA
Hoofed Animals, Sheep
Antelope, Deer,

How To Use This Guide Book

★

The sketch map on the inside front cover clearly indicates the main subdivisions of the Zoo, viz.: A-Mesa, B-Mesa, C-Mesa, D-Mesa and the three canyons: E-Canyon, F-Canyon and G-Canyon.

It is possible to determine the approximate location of any exhibit by referring to the alphabetical index at the back of the guide and the layout description at the beginning of the particular section in which the specimen in question is discussed.



GOLDEN-BELLIED MANGABEY *(Cercocebus galeritus chrysogaster)*

OFFICIAL GUIDE BOOK

# of the

SAN DIEGO ZOO

BALBOA PARK • SAN DIEGO • CALIFORNIA

SIXTH
EDITION

50c

PUBLISHED BY THE
ZOOLOGICAL SOCIETY OF SAN DIEGO

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A Friendly Request To Our Guests...

The animals in the San Diego Zoo have been captured and held in captivity for *your* education and your pleasure.

Your appreciation should prompt you to obey the laws of good behavior and assist the management in protecting the health and comfort of the animals.

The rules of common courtesy to captives—and compliance to a few specific regulations are all that is required to make your visit to the Zoo an enjoyment to yourself, to the animals, and to those who follow you . . .

(1) *Please do not feed the Anthropoid Apes.*

(2) Please do not attempt to attract an animal's attention by throwing *anything* within its cage.

(3) Please do not touch the glass or make quick motions in front of the snake cages.

(4) Please stay on the recognized paths and roadways. Do not take short-cuts.

(5) Please put all refuse in the black and white trash cans which are placed in convenient locations throughout the grounds.

Thank you.

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Zoological Society of San Diego

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MAIN ENTRANCE AND GENERAL OFFICE

INTRODUCTION

It is with none of the doubts that haunted us upon the appearance of the first edition of our official guide book that the Zoological Society of San Diego prepares for the publication of this revised edition. In nine years we have sold five editions of the guide amounting to more than 156 thousand books.

We still realize that no guide to a Zoological Garden can be technically perfect. Losses and gains in living collections are hourly events, which cannot be anticipated nor stopped. We have tried however to generalize this edition as we did the first so that it includes specimens which are no longer present but which we will most certainly be exhibiting within a short while, some lost specimens we may never be able to replace like our famous mountain gorillas, and some which have never been present but which are on order and may appear at any time.

The Zoological Society of San Diego was founded in October, 1916, by a group of five men called together by Dr. Harry M. Wegeforth for the purpose of establishing a zoological garden in San Diego. These men, who met in answer to a brief notice in the paper asking all who were interested in such a project to meet with him, were Dr. Paul Wegeforth, Dr. Fred Baker, Dr. J. C. Thompson, U.S.N., M.C., and Frank Stevens, one of the most famous of our local scientists.

This small group was incorporated and Dr. Harry M. Wegeforth elected President, a position in which he continued until his death on June 25, 1941. In this office Dr. Wegeforth was always more than the term "president of the Zoological Society" would imply. His job was that of manager, promoter, planner, financial advisor, and much of the time in the early days he was its sole financial support. Practically alone he raised all of the private funds with which the magnificent zoo was built. He visualized and planned all of its unique features. He traveled at his own expense all over the world, bringing back ideas not only from zoos but from parks, natural scenery, and from conversations with people famous for the work they had done in their native country. He made connections which enabled the Society to obtain not only zoological exhibits but rare shrubs and trees. It was through his interest in the relationship between diseases of wild animals and his own experience in human medicine that our Zoological Hospital was planned and built.

The Zoological Garden was both his hobby and his recreation. He sacrificed all of his leisure to the work which brought about the success of the zoo. He was never too busy to give it sympathetic attention and he fought from the start any political influences which would have sacrificed the zoo to other political expediencies and pet projects.

In 1922 the zoo was formally begun in its present location. The ground was the roughest, least cultivated and desirable part of Balboa Park. All of the plans that had been in the making had to be revised to fit the new location. In the area, amounting to almost two hundred acres, there was little level land and no planting except along the front street. But the greatest handicap was its obscurity, facing on a back street, and at some distance from the car lines. Into this area, Dr. "Harry," as he was known to thousands of San Diegans, moved the few animals from their temporary cages along Park Boulevard and the foundation of the now famous zoo was laid.

Three buildings left over from the 1915-16 Exposition were available for use and the first of these buildings to be formally taken possession of and opened was the building known as the International Harvester Building, which became the temporary Reptile House of the San Diego Zoo.

The first open grotto to be built was at the head of the present F-Canyon devoted to bears, seals, lions and tigers, and in it were placed a group of bears of several species. From then on until the present day the growth has been too rapid to record in so brief an outline.

The first large donation for building the outside fence was made to the zoo in 1922 by the late Miss Ellen Browning Scripps. The building of the Zoological Garden of San Diego has been carried on principally by private subscriptions. As these donations were made for specific cages, each was marked with a bronze plaque which reads, "Presented to the Children of San Diego by (the name of the donor added)." It has always been known as the children's zoo and the Zoological Society of San Diego has been in the position of responsible trustee, guarding and developing the zoo to the best advantage of the community and especially of the children.

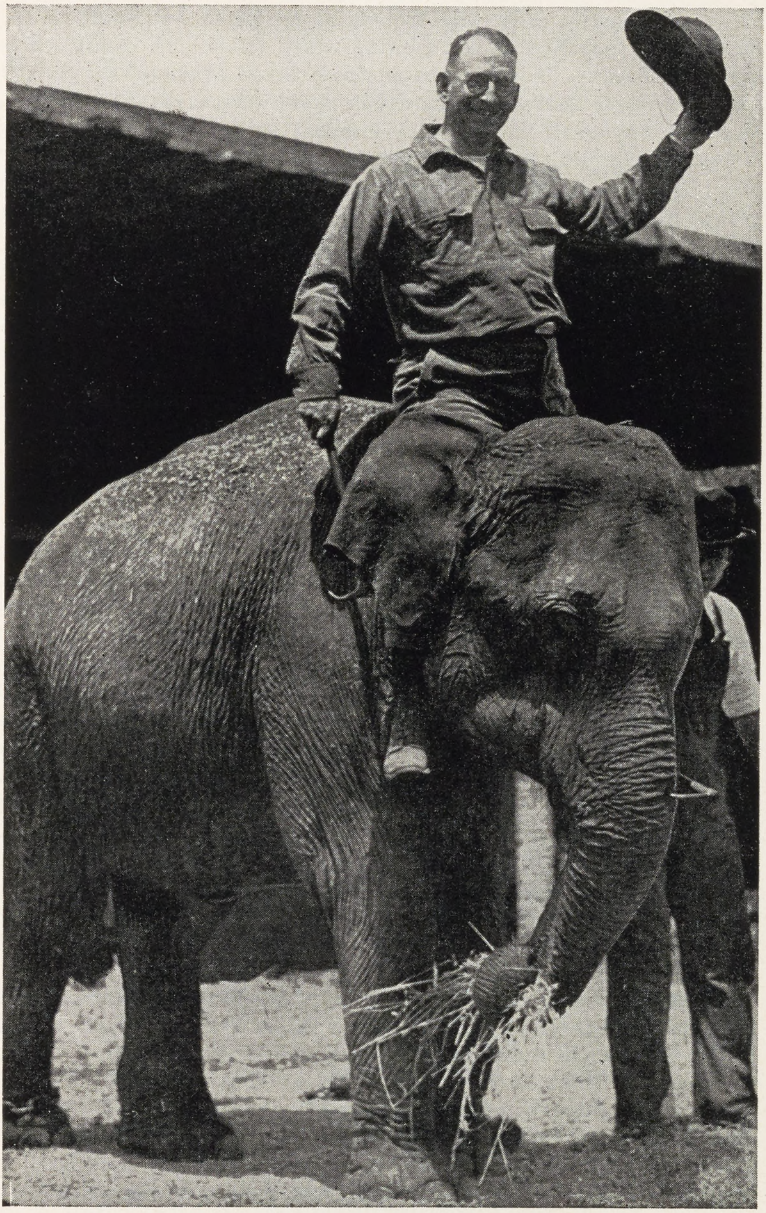
Possibly the greatest innovation made by this zoo was the first open barless grottoes for lions and tigers. These proved an outstanding success and open grottoes for these animals are now commonly accepted all over the world.

In the summer of 1927 Mrs. Belle J. Benchley who had been employed in the zoological garden as bookkeeper was promoted to the head of the zoo staff and a new position, that of Executive Secretary, created for her to take that position known as Director in most American zoos.

The history of the zoo cannot be given completely in so brief a foreword as this, but a few outstanding facts should be recorded. After several times voting special tax support for the Zoological Garden of San Diego, always to have their will nullified by some legal situation, the people of San Diego finally in 1934 gave this support in the form of a special tax which is a part of the City Charter and apparently a permanent arrangement. The money thus provided for the zoo goes entirely into an operating budget which is augmented by admission charges and other earnings of the Zoological Society in its many activities.

The Zoological Society operates the Zoological Garden of San Diego under an agreement made between the City officials, representing the City of San Diego, and the Zoological Society. By the terms of this agreement the Zoological Society will have control of the development and operation of the zoo so long as it maintains a creditable zoo. Its rapid growth, the beauty and rarity of its collection, and its many contributions to public welfare are so widely acknowledged that there seems little danger of any change in this original agreement.

The business of the Zoological Society is administered by a Board of Directors composed of twelve persons who are elected by the Zoological Society of San Diego at its annual meeting held on the first



THE ZOO WAS DR. WEGEFORTH'S HOBBY AND RECREATION

Monday of August each year. Officers of the board are elected by the Directors at their first annual meeting which follows the annual meeting of the Society. It is the duty of this board to determine the policies and to represent the Society officially in matters concerning the development and welfare of the Zoological Garden.

The Zoological Society provides the animals, the buildings, the equipment, and approximately two-thirds of the money for operating expenses of the zoo. It carries out the planting, does all of the building, and maintains the grounds as well as the animals and the animal cages. It contributes to the welfare of the community through its hospital in the way of general health. It has provided an educational program which is the most outstanding offered by any zoo in the world. This consists in part in the bringing of classes to the zoo in buses provided for that purpose under the guidance of an instructor employed by the Zoological Society. As many as fifteen thousand school children from the City and County schools have been brought in in a single school term, while as many more have come to the zoo with their own transportation and instructors to take advantage of the educational facilities so offered.

The animal hospital and quarantine station built in 1927 with funds donated by the late Miss Ellen Browning Scripps, protects the health of the animals through its supervision of food and hygiene as well as by caring for sick and injured specimens.

The Society has, since its beginning, been publishing booklets and pamphlets of a scientific and educational nature and is one of the few zoos to publish regularly a monthly magazine intended to keep the public informed as to its activities. "Zoonooz" has a paid circulation of about four thousand and a free circulation of nearly a thousand more. It is distributed all over the world. Most of the scientific bulletins have been on the reptile collection and have been the contribution of L. M. Klauber, Curator of Reptiles, and C. B. Perkins, herpetologist of the Zoological Garden. Reprints of scientific investigations by Dr. C. R. Schroeder of the Research Department working with different Research fellows have had wide distribution. During the war two bulletins on South Pacific fauna were prepared for servicemen.

Among the Zoo's outstanding specimens have been two Mountain and five Lowland Gorillas; Nelson's Bighorn Sheep; Maned Wolves; several Koalas; Guadalupe and Galapagos Fur Seals; Northern Elephant Seals; an Hawaiian Monk Seal; Kagus; Hawaiian Ducks; three Philippine Monkey-eating Eagles; a California Condor; and a Tuatara. The exhibit itself is famous for the number of babies always on display, and while the Society cannot take credit for the favorable climatic conditions, it can take credit for the large roomy cages with sufficient privacy to encourage breeding, and the scientific feeding formulas which have brought fertility to a high point in zoo history.

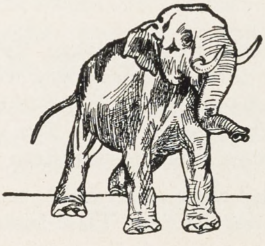
The attendance at the zoo has increased steadily and with the local congestion of war installations and defense plants has reached nearly a million a year.

An innovation in the San Diego Zoo which is unique among zoos is the group of sightseeing buses which make hour-long trips over the three miles of road. The drivers are trained lecturers who give full information upon the exhibits and planting, answering questions accurately. The bus fares which riders must pay support the educational program which consists of taking the zoo to the public schools with colored slides and trained speakers, and bringing several classes daily from the schools to the grounds in zoo buses for an educational tour.

Another unusual feature of the Zoological Garden of San Diego is the small amphitheatre called, in honor of the president and founder of the Society, "The Wegeforth Bowl." In this, animal acts and other attractions such as pictures and lectures are presented.

Membership in the Zoological Society of San Diego is open to everyone. The Society has felt that it was better to have a few hundred members who were really interested and who would retain their membership, rather than to make intensive drives for large membership and secure thousands of members who were not interested in the zoo individually but who answered the call because they felt a public obligation to do so. Annual membership of $5.00 a year includes free admission into the Zoological Garden for one year and provides guest passes for the member's convenience. It also entitles the holder to all of the publications of the Society and to a voice in the affairs. The annual meeting of the Zoological Society is held on the first Monday of August. A picnic supper in the zoo picnic grounds, followed by a brief meeting and some form of entertainment, has become a tradition.

While the Zoological Society was founded in 1916, the zoo in its present location came into being in 1922, opening with a small group of make-shift cages scattered over the mesas of the two hundred acres, now almost completely filled with grottoes, cages, and natural enclosures.



HOW TO REACH THE ZOOLOGICAL GARDEN OF SAN DIEGO

The Zoological Garden of San Diego lies in the north end of Balboa Park, along a side street called Alameda Drive, one block west of Park Boulevard, and extends to the Eleventh Avenue Canyon.

AUTOMOBILE ROUTES:

1. To those visitors to the Zoological Society who come into San Diego from the north on Highway 101, Coast Route:

A. Follow Pacific Highway or either of the alternate parallel highways Kettner Boulevard or India Street, south to Laurel Street; turn east on Laurel, driving directly into Balboa Park over the beautiful Cabrillo Bridge; turn north on Alameda Drive, where an Auto Club sign directs to the zoo. Both entrances into the Zoological Garden are on this street.

B. Those cars which leave the Pacific Highway at North San Diego (Old Town) and go up over Mission Hills through Presidio Park should follow West University or Washington Street to Sixth Avenue, turn south on Sixth and east on Laurel Street at the entrance of Balboa Park. Crossing Cabrillo Bridge, follow Laurel Street to Alameda and turn north on Alameda Drive at the sign.

2. To visitors coming from the East over Highway 80; follow either University Avenue or the alternate and parallel highway of El Cajon to Park Boulevard; turn south on Park Boulevard, turning right just south of the Roosevelt Junior High School at the junction of Alameda Drive and Park Boulevard; drive south on this Alameda roadway until either of the gateways into the zoo is reached.

3. From downtown areas: Either Sixth or Twelfth Avenue will lead the visitor directly to Laurel Street, the main thoroughfare east and west across Balboa Park. Signs on Laurel point to the main entrances to the zoo on Alameda Drive.

BUSES:

4. To those using public transportation: Take any eastbound number seven bus from any corner on Broadway west of 12th Street. This bus runs along Park Boulevard (a block east of the zoo) and makes two stops, one for each of the two entrances. The same bus on its inbound trip is available to visitors from northeastern sections of San Diego.

Buses numbers one and three are available to persons who live in the Mission Hills and Hillcrest districts. These buses take you to Fifth and

Laurel. The walk from this point along Laurel Street through the park is rather long but it is a delightful way to see Cabrillo Bridge and the park buildings. Those who wish to be taken as near to the zoo as possible may take either bus to the center of town and transfer there to bus number seven.

GENERAL INFORMATION

Hours:

The zoo opens at 8 a.m. every day of the year. Except during the winter season, the closing hour is 5 p.m. During November, December, January and February, the closing hour is 4:30 p.m.

Entrances and Exits:

There are two entrances on Alameda Drive. Exit turnstiles are plainly marked. They are near the entrances.

Parking Facilities:

Free auto parking is available for zoo patrons inside the zoo grounds within an area between the two gates. This parking lot lies on the west side of Alameda Drive and has capacity for four hundred cars at one time. Free parking along the street is subject to municipal regulation.

Eating Places:

The Zoological Garden has an excellent cafe, serving short orders and sandwiches. The menu is planned and prepared especially with children's requirements in mind. Counter, fountain and table service is available. Prices are held to the down-town level.

Refreshment Stands are scattered throughout the extensive zoo grounds. Soft drinks, candy, peanuts and food for the animals, where feeding is permitted, may be purchased at these stands. Films may be purchased and a camera rented at all stands and regulation movie film is also available at several of the stands and at the cafe.

Souvenirs suitable as gifts or reminders of your zoo visit can be purchased at most of the stands and the cafe. The official guide books may be obtained at either gate. Post cards showing grounds and animals can be mailed at the entrances.

Picnic Grounds located near each entrance are provided with tables, and hot and cold drinks may be purchased at the cafe or stands. At the south picnic grounds, near the Main entrance, free gas and water are provided for cooking and preparing lunches.

Bus Trips through the zoo of one hour's duration leave from each entrance at stated intervals. The time schedule varies with the day of the week and the time of year. The fee for the trip is: Adults 50c, children 25c. This is a quick and interesting way to see the entire zoo and gives the visitor the best possible idea of the layout.

Added Attractions to the Regular Entertainment provided by a large, rare collection of animals, are the trained Animal Acts in the Wegeforth bowl on A-Mesa, and other acts and performances as announced by daily papers and zoo signs.

Admission into the Zoological Garden: Adults 40 cents including government tax; children under sixteen are admitted free of charge.

Members of the Zoological Society Are Admitted Free. Annual Membership, $5.00 per year. Inquire at either gate for privileges and obligations of membership in the Zoological Society of San Diego.

Private Cars are not admitted to the Zoological Garden.

GENERAL OFFICES AND OTHER BUILDINGS

The General Office is located at the Main Gate on Alameda Drive, opposite the short Calle de Colon.

Animal Commissary, nursery and general storage and workshops are centered at the extreme north end of the Zoological Garden in one industrial center. This industrial center lies between G-Canyon and D-Mesa and may be entered at the extreme east end of D-Mesa.

The office of the Veterinarian is at the hospital. Those having appointments for business at the hospital may reach it by walking directly north through the first archway east of the San Diego Museum, past the Globe Theatre.

Other buildings in the Zoological Garden are the Board Room, intended for use of board meetings, and small official groups, near the South or Main entrance, and the Educational Building which, although located inside the Zoological Garden, has been temporarily given over to the Red Cross.

GENERAL PLAN OF THE ZOOLOGICAL GARDENS

The Zoological Garden of San Diego lies in the north end of Balboa Park, along a side street called Alameda Drive, one block west of Park Boulevard, and extends to the Eleventh Avenue Canyon.

It covers approximately two hundred acres and is planted throughout its area with rare tropical trees and shrubs especially appropriate for the character of the exhibit. It is acknowledged to be one of the most extensively cultivated and horticulturally unusual portions of the park. Special pains have been taken to make this garden interesting and educational. Signs mark most of the trees and shrubs, as well as animal cages.

The entire area is divided by a series of canyons into four mesas. The mesas or tablelands are devoted to those exhibits which require buildings and cages. The canyons dividing them are used for pools, and open grottoes, and where not suitable for such purposes have been beautifully planted into Lily Dells, Fern Canyons, and other scenic gardens.

The four mesas, starting with the south border of the zoo, are lettered with the first four letters of the alphabet and are called A-Mesa, B-Mesa, C-Mesa and D-Mesa. The canyons are lettered, beginning with the one farthest south, E-Canyon, F-Canyon and G-Canyon.

ROADS

In spite of the rough topography of the Zoological Garden, it is an easy place to find your way around. The main road runs north and south following the east boundary of the zoo. Side roads lead from this main road circling each mesa and returning, or leading down one canyon and returning by the next to the main roadway. Round trips through the gardens may be made by the pedestrians, who can return to the main road after visiting each mesa or canyon without retracing their steps.

MESAS

A-Mesa:

Entering the main gate brings the visitor directly onto A-Mesa.

This mesa houses the Reptile collection. The first exhibit is the reptile house, an all out-of-doors exhibit so far as the visitor is concerned. He walks under an open arcade, viewing the snakes through heavy plate-glass windows. Sunlight from above the cage gives sufficient light for photographing the reptiles.

A-Mesa slopes toward the south and west. This area west of the snake house is given over to open lizard pits and pits for small reptiles and snakes, turtle and tortoise pens, and alligator and crocodile pools. Galapagos and other giant tortoises are on this mesa south of the water turtles.

On A-Mesa the Wegeforth Bowl is located. In this open amphitheatre animal acts are performed as announced and other attractions are offered as advertised locally.

B-Mesa:

This is often called the Children's Mesa and is devoted to the primate and cage-bird collection.

The cafe gate opens onto B-Mesa where the small monkeys are housed in one group of cages built around a hollow square. The Great Apes and Baboons are housed on the north half of B-Mesa.

All birds of the Psittacine family are grouped on this mesa either in one large group of cages or individual arched cages. Small finches, toucans, gallinaceous birds occupy a group of cages on the west slope of this mesa. The two great Flying Cages can also be viewed from this mesa. On the south is the Shore and Marsh Bird Cage, known as the Scripps Cage; on the north the cages for Birds of Prey.

C-Mesa:

Here we find the Heavy Mammal group. This mesa is used for the exhibition of tapirs, giraffes, elephants, camels and llamas, hippopotami and rhinoceroses, as well as the rodent display. Temporarily some of the marsupials are exhibited here.

D-Mesa:

This is the mesa where most of the hoofed animals, including sheep, goats, antelope, deer, and oxen, are exhibited.

CANYONS

To those persons who do not wish to take the bus trip and who prefer to walk only a short distance, we can advise that they may see many of the canyon exhibits from vantage points on the level mesa roads and trails without venturing into the canyons. To every pedestrian in the zoo we make the appeal that they refrain from following the irregular paths which impatient, thoughtless children have worn through the plantings straight down to the roads below. A large number of wide, paved and graded paths have been provided for your convenience. These are marked by signs and are equipped with shade and benches. They lead directly to the things most worth seeing.

E-Canyon:

This is a wild bird sanctuary as well as exhibit area. You can enter directly north of A-Mesa, turning down the hill between A- and B-Mesas. On the north side of the road are open pens for cranes and herons. A rare collection of birds can be seen along this hillside. The ducks, geese, swans and ostrich are also housed in this canyon, which joins F-Canyon at the lower west end. In this canyon the duck dam is an exact replica of Barrett Dam of the impounding system of San Diego, built to scale. From October 1st to March 15th both dams are filled with migratory birds. E-Canyon can be reached also by the stairs on either side of B-5, the Scripp's Flight Cage.

F-Canyon:

This might well be called the Grotto and Pool canyon, for beginning at the upper, or east, end is the series of open barless grottoes for bears, lions, and tigers, divided from each other by a series of pools for the exhibition of the large group of sea mammals.

Beyond the tiger grotto where G-Canyon, and eventually E-Canyon, converge, can be seen the large birds of the stork family, as well as Cassowary and Emu.

F-Canyon lies between B- and C-Mesas and can be reached from the north corner of B-Mesa by a beautiful walk through the Fern Canyon, where you emerge from this highly tropical area at the Lion grotto, or from the south point of C-Mesa by the paved road. The stairs by the Eagle cage, B-17, lead to F-Canyon.

G-Canyon:

This houses the members of the swine family, the canine tribe and such small miscellaneous creatures as the raccoons, binturongs, and lesser pandas. It lies between C- and D-Mesas. Main roads leading to it are to be found at the south edge of D-Mesa or turning north and east off of F-Canyon just west of the tiger grotto. The leopards, pumas, black panthers, and jaguars are housed on the east and south sides of G-Canyon; the small cats, foxes, swine and canines, as well as the cheetahs, are housed along the north and west sides of the roadway.

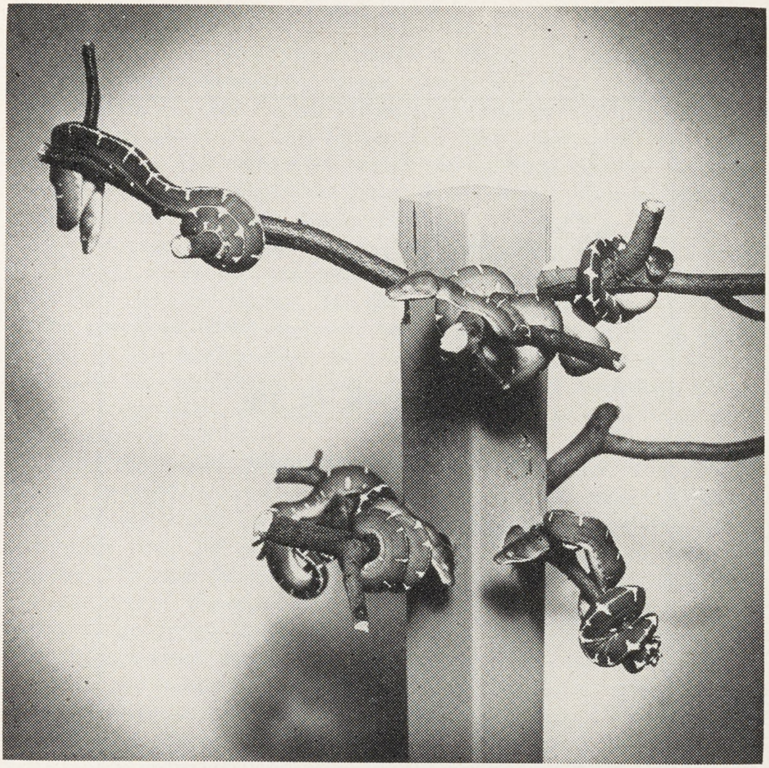
ZOOLOGICAL HOSPITAL AND RESEARCH LABORATORY

The Zoological Hospital and laboratory are intended for the use and better care of the Zoological collection housed in the garden and not for private use in the treatment of pets or domestic animals.

Veterinarians are privileged to consult with the staff and use the facilities of the hospital when they require it. The hospital is not open to general visitors, as the life and safety of sick animals can easily be destroyed by curiosity seekers. The society maintains a private quarantine station in connection with the hospital and general visitors to the hospital might also jeopardize the recognition of the official nature of this quarantine by the public departments of health.

Consultation or visits with the Veterinarian of a scientific and official nature can be arranged by telephoning the Administration Office of the Zoological Garden.

HAIRY SAKI *(Pithecia monacha)* AND GOLDEN-HEADED SAKI *(P. p. chrysocephala)*



ZOO-BORN EMERALD TREE BOAS *(Boa canina)*

Reptiles

. . . "A" MESA . . .

Please...

Do not touch or tap on the glass or make rapid motions in front of any of the cages.

☆

REPTILES

A short distance from the entrance to the Zoo is the Reptile Mesa, A-Mesa, where crocodilians, lizards, snakes and turtles are displayed. The first exhibit is the Reptile House, a rectangular building with four corner cages about ten feet square and fifty cages four feet square along the sides. The visitors are outside the building, viewing the snakes through plate glass windows. Thus there are no offensive odors so commonly associated with Reptile Houses.

On each cage is a card giving both the common and scientific names of the snake, its range, food habits, and other pertinent information. A red seal on the card signifies that the reptile is poisonous.

The corridors which contain the cages are maintained at eighty degrees F. The smaller cages fit closely against the windows and are removable for sterilization. Inside the building is a workshop, a store room, a boiler room, a laboratory, as well as a large sunny airy room for raising rats and mice.

Behind the Reptile House other reptiles are displayed in enclosures ranging in size from the large field for the group of giant tortoises to a series of small pens for the various aquatic turtles. The lizards have pens with large hollow artificial boulders for protection from the weather. The crocodilians have large tanks of water in which they spend a great part of the time. The various pens are numbered and each carries a sign giving the name and distribution of the occupants.

Although there are large signs asking the public not to touch the glass or make motions in front of the cages, some people, thoughtlessly or deliberately, annoy the snakes. We have lost valuable specimens from mouth injuries caused by the snake hitting its nose against the glass in an endeavor to strike its tormentor.

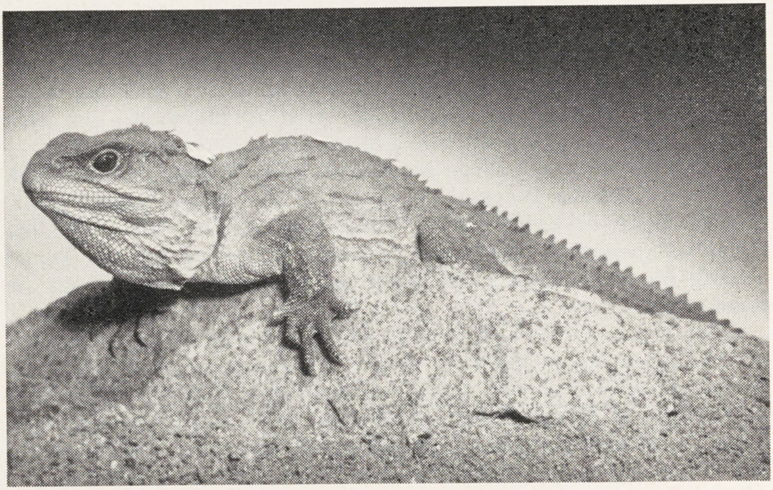
Under the best of circumstances snakes are very difficult creatures to keep in captivity. Not only do the various species have their own food preferences, but also many specimens have their own individual peculiarities in feeding habits. Also snake diets may vary with age, young snakes feeding on lizards, frogs or fish, then graduating with age to rodents or some other form of animal life, including other snakes. All snakes feed upon animals and none is vegetarian.

Most of the snakes feed publicly and are fed each Monday morning. Feeding intervals for our specimens vary with the age of the snake, young individuals, because of their more rapid growth, being fed once a week. With increasing age, the feeding interval is generally lengthened to two or three week periods. As with people, it is possible for a snake to eat too much and to become obese in time. Most of our specimens are fed mice or rats and these are killed before being offered to the snakes. Our garter and water snakes feed exclusively upon a diet of fish.

The large Reticulated Python and Anaconda are generally fed once a month, taking 10 to 20 pounds at a feeding which consists of strips of horsemeat with a small dead chicken tied to one end.

Although for educational purposes we endeavor to display as many local snakes as possible, we cannot show them all. Some of our most beautiful species spend a good deal of time under ground or are too small for exhibition. About 60 per cent of the snakes on display are from foreign countries.

Every zoo has rare animals and in the Reptile House we have several specimens that are unique. Most important, from the standpoint of zoological interest and rarity, is the **Tuatara** *(Sphenodon punctatus)*. This is a lizard-like reptile that is neither lizard nor snake, turtle nor crocodilian; it is so distinct anatomically from the rest of the reptiles that it is placed in a group of its own, the Rhynchocephalia. This group of reptiles flourished a good many million years ago, finally to die out with the exception of the Tuatara which has survived down to the present.



TUATARA *(Sphenodon punctatus)*

Formerly abundant in New Zealand, it has, with the advent of the white colonists, become extinct upon the main islands and is now confined to several off-shore rocky islets where it is very strictly protected by the government. Our specimen was a gift of the New Zealand government to the people of the United States. Another rarity is our group of albino gopher snakes. Albinism is rather rare in snakes and, as in other animals, is caused by a lack of black pigment in the skin. Our specimens are all descended from a single young female which was brought to the zoo in 1940. The female was reared to sexual maturity and then, by careful and selective breeding, our present strain was established. Another group of rarities to be viewed at the Reptile House are the hybrid rattlesnakes. The captive breeding of snakes is in itself enough of a rarity to cause considerable comment, but the crossing or hybridizing of snakes in captivity is of considerably less common occurrence. These hybrid rattlers are the offspring of a male **Mojave Green Rattler** *(Crotalus s. scutulatus)* from Tucson, Arizona, and a female **Aruba Island Rattler** *(C. unicolor)*. The hybrids are now old enough to produce their own living young, an event which has occurred three times.

The largest of all snakes is the **Reticulated Python** *(Python reticulatus)* which is found from Burma through the Malay Peninsula to the East Indies and the Philippine Islands. Very large specimens are known to reach a length of 33 feet. Many other kinds of pythons are to be viewed here, including the **Blood Python** *(P. c. curtus)*, so-called because of its color, of the East Indies, African **Ball Python** *(P. regius)*, **African Rock Python** *(P. sebae)*, **Indian Python** *(P. molurus molurus)* and **Java Python** *(P. m. bivittatus)*. Nearly all pythons are confined to the Eastern Hemisphere, but two exceptions occur in the New World; these are the dwarf pythons *(Loxocemus)* of southern Mexico and Central America, small species reaching a length of about 3 feet.

Boas are to be found in both the Old and New World although their headquarters may be said to be in the New World. They are much more adequately represented in the Old World than are the pythons in the New World. Two species of boa occur in the western part of the United States, and one, the **California Boa** *(Lichanura r. roseofusca)*, is moderately abundant in San Diego County. In our collection boas are extremely well represented and range in size from the diminutive **Sand Boa** *(Eryx jaculus)* of arid North Africa to the **Boa Constrictor** *(Constrictor constrictor)* of Mexico, Central and South America which attains a maximum size of 9 to 15 feet. The most gorgeously colored representative of the Boa group to be seen here is the **Emerald Tree Boa** *(Boa canina)* of Brazil and the Guianas. The adults are a beautiful green in color, but the newly born young are bright red, changing rather abruptly to the green of the adult during the seventh month of life. Other boas in the collection are the **Cuban Boa** *(Epicrates angulifer)*, **Bahaman Boa** *(E. striatus)*, **Rainbow Boa** *(E. cenchris maurus)* of South America, the **Trinidad Tree Boa** *(Boa enydris cooki)* and the **Anaconda** *(Eunectes scytale)*.

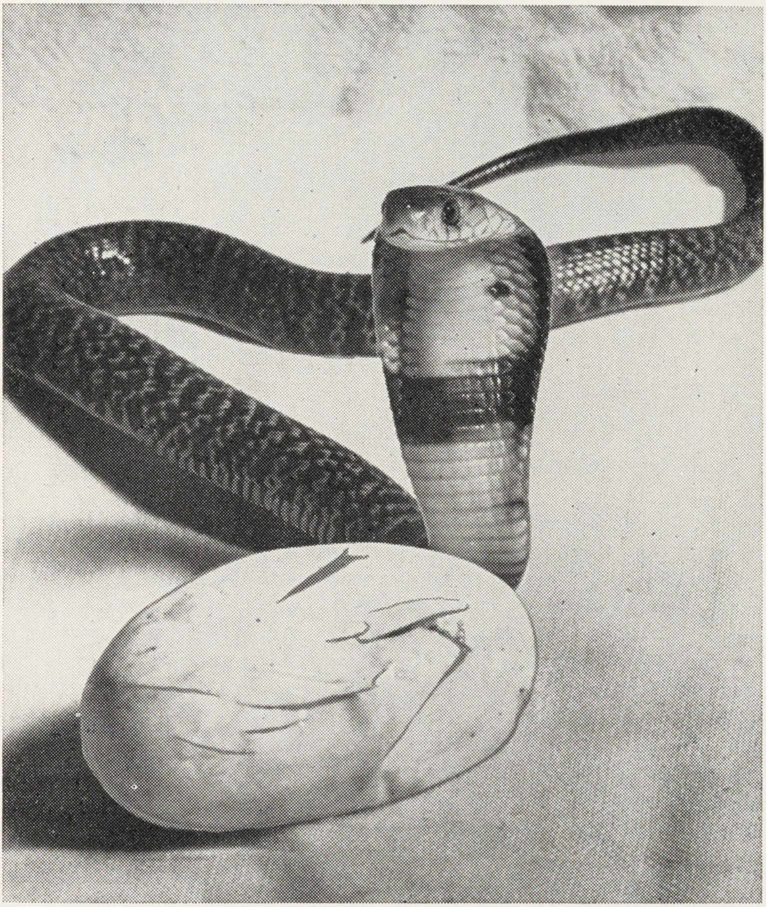
To the casual visitor snakes are snakes—cold, slimy, ugly and poisonous. As a matter of fact, their temperature is that of their surroundings; they are dry, never slimy, but rather satiny to the touch; if beauty is to be considered as a combination of grace, design and color, they are beautiful. Relatively few are poisonous; as a matter of fact, of the approximately 2500 different kinds of snakes known to science only about 250 species or 10 per cent are dangerously poisonous.

As a general rule most snakes are beneficial in that the snake's diet is composed of animals that are pests insofar as man is concerned. A great majority of snakes live upon a diet of mammals such as ground squirrels, gophers, rats and mice, and therefore these snakes actually perform a service to mankind in the control of these noxious pests. Many snakes have thus derived their names from the fact that they are known by the layman or farmer to prey upon a particular type of animal. The rat snakes (Genus *Elaphe)* are so called because of their preference for rats. They may also eat birds and, around a farm, occasionally take baby chicks. However, the harm done by killing a few birds is more than offset by the large number of harmful rodents eaten. One of the most beautiful snakes in the United States is the **Corn Snake** *(Elaphe guttata guttata)*. It has received its common name because it is so often found in cornfields where it is searching for mice.

The genus *Pituophis* contains the snakes that are commonly called pine snake, bull snake, blow snake, and in the coast states gopher snakes. There are usually half a dozen or more species on display including the **Pine Snake** *(P. m. melanoleucus)*, **Mexican Gopher Snake** *(P. deppei)*, **Baja Californian Gopher Snake** *(P. catenifer bimaris)*, **Bull Snake** *(P. c. sayi)* and also our own **San Diegan Gopher Snake** *(Pituophis c. annectens)*. These snakes have a flap of skin in the mouth against which the expelled air of the lungs is forced in such a way as to make an extra loud hiss, a sound similar to that produced by a human blowing edgewise on a blade of grass.

King snakes (Genus *Lampropeltis)* are among the most beautiful of snakes. Several are marked with cross bands of red, black and yellow, while others have a chain-like design. The **Speckled King Snake** *(L. getulus sayi)* is black with a yellow spot on each scale; another has a longitudinal stripe down the center of its back. They get the name king snake because they kill and eat other snakes. Poisonous snakes as well as harmless ones are eaten, but the story that the king snake goes out looking for the rattler just to pick a fight is not true. Rodents, lizards, and occasionally birds are eaten, as well as snakes.

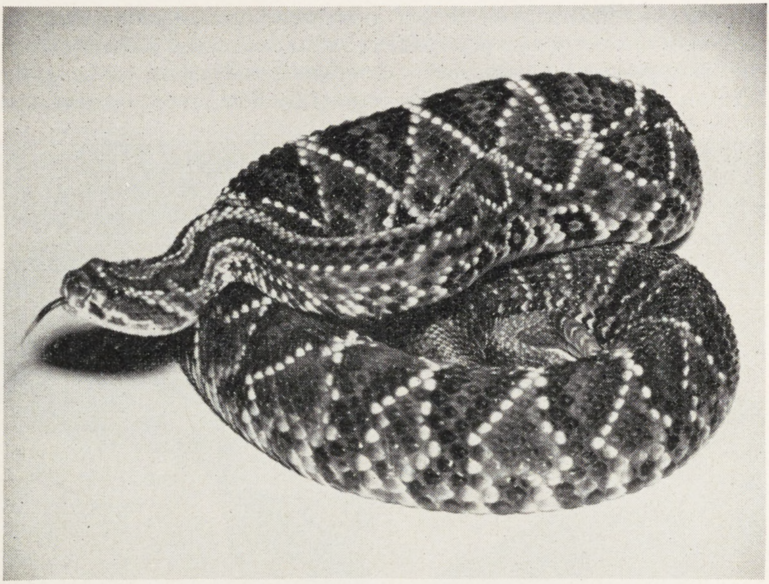
Snakes vary considerably in their mode of life, that is, some of them spend a great deal, if not all of their lives burrowing in the ground and completely concealed from human eyes. The majority are terrestrial, living above ground in the tangle of brush, rock and weeds, while many others are arboreal, some perhaps never descending from their tree haunts to roam over the ground. Conforming with this pattern of existence, their bodies have assumed shapes, patterns and colors adapting them most favorably to their chosen environment. For example, the African **Bird** or **Twig Snake** *(Thelotornis capensis)* is a remarkable illustration of this adaptation to a tree-dwelling life for its body is extremely thin and drawn out, much resembling a thin branch or twig in shape. To make even more perfect the resemblance to the trees in which it lives, its drab coloration blends superbly with the dark bark of trees and its pattern of cross bands creates a bark-like effect to the appearance of the snake. Another tree-dwelling snake is the African **Boomslang** *(Dispholidus typus)*, a Boer word meaning tree



CAPTIVE-BRED INDIAN COBRA *(Naja naja)*

snake. This is a back-fanged snake that is deadly to the lizards, small rodents and birds that it lives upon.

There are a great many different species and subspecies of water snakes (Genus *Natrix)* and garter snakes (Genus *Thamnophis)*. About 100 specimens, representing a dozen or more species, are shown in a pit (A-2) just behind the Reptile House. The undergrowth is generally so thick that seldom are more than fifteen or twenty seen at one time.



SOUTH AMERICAN RATTLESNAKE *(Crotalus durissus terrificus)*

The word cobra brings to mind a snake with the forward part of its body raised straight up in the air with several inches of neck spread out in a hood or cape about the size of a hand. The mental picture is true enough except that the only time the hood is spread is when the snake is nervous or irritated and the public gets no chance to see this because a blind is put over the window to give the snake a chance to calm down. Therefore the various cobras (Genus *Naja)* on exhibition do not make much of a display. In point of years in captivity our oldest snake is a **Black Cobra** *(N. melanoleuca)* received in 1928 which holds the world's record for longevity for cobras in captivity. Throughout the world cobras have many relatives belonging to their clan, the family Elapidae. Included among these are the very dangerous mambas *(Dendroaspis)* of Africa and the kraits *(Bungarus)* of India and the Orient. Australia has more venomous than harmless species, and in that region all the venomous snakes belong to the family Elapidae. The **Tiger Snake** *(Notechis scutatus)*, although having a very potent venom, causes relatively few deaths in Australia. A beautiful and graceful elapid snake from the continent down under is the **Red-bellied Black Snake** *(Pseudechis porphyriacus)*.

There are only four dangerously poisonous snakes in the United States. They are the rattlesnake, the copperhead, cotton-mouth moccasin, and the coral snake. The coral snakes *(Micrurus* and *Micruroides)* are members of the family Elapidae and therefore related to the cobras. They are banded (the bands encircle the body) in black, red, and yellow, but they differ from all similarly colored snakes in the United States in the arrangement of the bands. The black band is bordered on each side by a yellow band, the sequence being red, yellow, black, yellow, red, etc. Several snakes appear at first glance to be just like the poisonous coral snakes but a moment's observation will show the difference in the order of the bands. We cannot display the poisonous coral snakes because they remain buried in the sand, out of sight, most of the time. The best we can do is to show snakes with somewhat similar markings and explain the difference on the card.

The remaining poisonous snakes of the United States, the rattlesnakes, copperheads and water moccasins, are all pit vipers. They are so-called because of a pit in the side of the head between the eye and the nostril and just below a line drawn between them. This pit has a delicate membrane stretched across its interior and this membrane is richly supplied with tiny nerves which are sensitive to heat waves. By this means the pit vipers are enabled to locate and direct a strike at warm-blooded prey, such as mice or rats, without actually being able to see them.

In the United States there are found 29 species and subspecies of rattlesnake belonging to two genera, *Sistrurus* and *Crotalus*. All of these have been displayed at one time or another over a period of years and several species are always to be seen on display. The **Eastern Diamond-back** *(Crotalus adamanteus)* grows to a larger size than any other rattler in the United States. Specimens exceeding eight feet have been reported but anything over six feet is to be considered very large. Stories about large snakes that have not been accurately measured while alive are to be taken with a grain of salt. We have large specimens of the **Western Diamondback** *(C. atrox)* that have been in the same cage since 1936, certainly long enough to become accustomed to the public, but they are so easily irritated by someone teasing or knocking on the glass that many times the blind is put in front of the cage early in the day.

Rattlesnakes add a new segment to the rattle every time they shed their skin, which is several times each year. Rattles get broken off, often several at a time. There is no way to tell the age of a rattlesnake by the number of rattles. The button on the end of a complete string is smooth and rounded and very little smaller than the segment next to it. The public often mistakes the end part of a broken rattle for the button. When the snake is growing rapidly the string of rattles, if complete, is triangular in shape. In old snakes all of the segments are practically the same size.

The cottonmouth, or water moccasin, and the copperheads belong to the same genus, *Agkistrodon*. In the United States there are four races of copperheads and two of water moccasins. A very beautiful representative of this group on display at the Reptile House is the **Cantil** or **Mexican Moccasin** *(A. b. bilineatus)*, chocolate-brown in color with the head outlined with golden-yellow.

While the true vipers, which differ from the pit vipers in lacking the heat-detecting pit in the side of the head, are found only in the Old World, pit vipers occur in both the Old and New World. A gorgeously colored Asiatic pit viper is the **Bamboo** or **Wagler's Pit Viper** *(Trimeresurus wagleri)*, a species said to be kept by the natives in their snake temple on the island of Penang.

Many of the vipers of the Old World are very heavy-bodied and sluggish appearing creatures. They are primarily nocturnal animals and by day are generally to be seen only quietly resting in their cages. A very beautiful species is the **African Puff Adder** *(Bitis arietans)* with its golden and black coloration. It receives its name from the very loud and forceful hissing it makes when annoyed. Perhaps even more attractive in appearance, and also more feared for its deadliness is the **Gaboon Viper** *(B. gabonica)* of tropical Africa. A smaller member of the group to be seen here is the **Horned Viper** *(Aspis cerastes)*, very similar in appearance and habits to our own Sidewinder of the southwestern American deserts.

The public has the idea that a poisonous snake can be recognized by the shape of its head or the fact that it has a broad, triangular head and a slender neck whereas a harmless snake seems to have no neck at all, the head and body being about the same size—but this, like most common beliefs concerning snakes, is not true. It is often believed that poisonous snakes have eyes with elliptical pupils and harmless snakes have round pupils. These ideas are false, as there is no way to tell by appearance whether a snake is poisonous or not. Of course, any snake that has rattles is a rattlesnake and all rattlesnakes are poisonous, but a visit to the Reptile House will show both poisonous and harmless snakes with round pupils and both with elliptical pupils; both poisonous and harmless snakes with a wide head and slender neck, and both with a narrow head and no noticeable constriction at the neck.

Another erroneous belief about harmless and poisonous snakes is that the harmless species hatch from eggs and the poisonous ones are born alive. It is true that the United States pit vipers (rattlers, copperheads, and cottonmouth moccasins) all deadly, are born alive but, on the other hand, the harmless garter snakes, water snakes and boas, as well as others, also bear their young. A great many harmless snakes, for example the bull snakes, gopher snakes and king snakes, are hatched from eggs, as are the poisonous coral snakes. No rule really separates the harmless from the deadly except the possession of poison glands and fangs.

CANTIL *(Agkistrodon b. bilineatus)*

Of the four dangerously poisonous snakes found in the United States, the rattler is the most common. Every state in the Union, except Delaware, has one or more species or subspecies in its herpetological list, although the records for Maine are unsatisfactory. The copperhead is found in the eastern and southern states as far west as Kansas and Texas. The cottonmouth moccasin is partial to an aquatic habitat and occurs in the southeastern states and in the Mississippi Valley, as far north as southern Illinois. One coral snake inhabits the southeastern and lower Mississippi Valley states, and another species is found in Arizona and eastward to the neighborhood of El Paso, Texas.

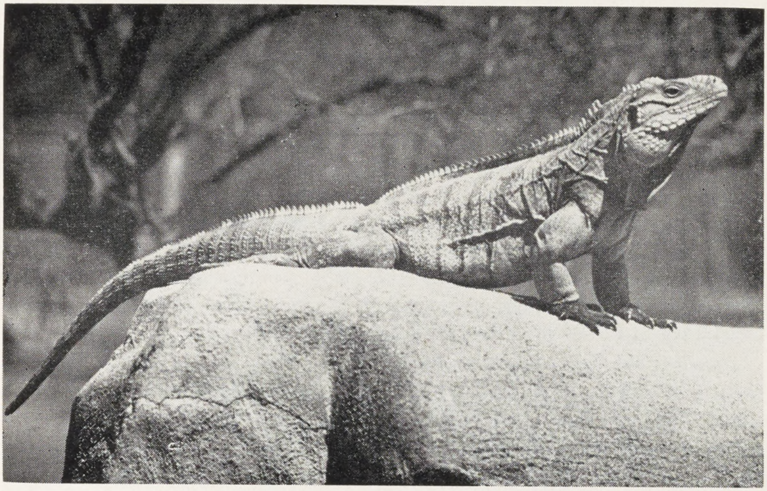
LIZARDS

A short distance west of the Reptile House are two large pits which house the majority of the lizards that are on display. One pit, nearest the Reptile House, contains several species of the large lizards that are generally called monitors (Genus *Varanus*). There are big six-footers *(V. salvator)* from the Malay Peninsula, as well as **Australian Lace Monitors** *(V. varius)* with a design like lace on their long necks. A smaller and more pallid species is the **Desert Monitor** *(V. griseus)* from North Africa eastward to northwestern India. Other large lizards to be seen in this pit are an attractive pair of **Cuban Iguanas** *(Cyclura macleayi)* and an excellent specimen of the **Rhinoceros Iguana** *(C. cornuta)* of Haiti. The latter is so-called because of the presence of a group of short horns on the snout.

In the other pit may be seen a number of species of lizards ranging in size from the small chuckwallas *(Sauromalus obesus)* to the large Cuban Iguanas and **Green Tree Iguanas** *(Iguana iguana)* of tropical America. Usually there are on display specimens of the Galapagos iguanas *(Conolophus)*. Most of the lizards in this enclosure are members of the family Iguanidae which is nearly confined to the New World, but which has representatives in Madagascar and the Fiji Islands. An Old World family with numerous species and widespread distribution is the family Agamidae. The African mastigures, or spiny-tailed lizards *(Uromastix)* to be seen in this pit are members of the latter family. Most of the lizards in this enclosure are strictly vegetarian, while a few, such as the Cuban Iguanas and the spiny-tailed iguanas *(Ctenosaura)* will eat both meat and vegetation. During warmer months many of the lizards will be seen in the Palo Verde trees eating both the leaves and the blossoms.

The close approximation to a natural habitat afforded by this open air enclosure permits the lizards to live in a nearly normal manner. We have had the Galapagos iguanas breed, lay eggs and the young hatch here. During the warmer summer months the lizards may be seen pursuing one another, male chasing male from coveted territory. The iguanid lizards also may be seen frequently bobbing their heads up and down and performing "push-ups." These motions are an indication of nervous alertness or less serious attempts at bluffing or intimidating a rival male at some distance.

None of the lizards in this pit is poisonous, but can give a severe and painful bite. The only two poisonous lizard species in the world are the **Gila Monster** *(Heloderma suspectum)* of the southwestern United States and the **Beaded Lizard** *(H. horridum)* of Mexico. Both of these are to be seen on display in the Reptile House. In captivity these lizards do very well on a diet of egg yolk, a well-fed specimen acquiring a very fat tail. The Gila Monster is not found in California, reports to



CUBAN IGUANA *(Cyclura macleayi)*

the contrary being based on such harmless lizards as the chuckwalla or Desert Banded Gecko. The joint or glass "snakes" *(Ophisaurus)* occurring in the central and southern United States are in reality lizards. Since they are brittle-tailed, as are so many lizards, their common names are very appropriate. When caught by an enemy, the tail breaks off and wriggles about although severed from the body; the pursuer, distracted by the violently moving tail, overlooks the lizard quietly gliding away to safety. A new tail grows, but the story that the old tail rejoins the body is just another myth. San Diego County has a **Legless Lizard** *(Anniella pulchra)* about the size of a lead pencil. The most important difference between a snake and a lizard is that a lizard has a chin whereas the two lower jaw bones of a snake are not connected in front by bone.

CROCODILIANS

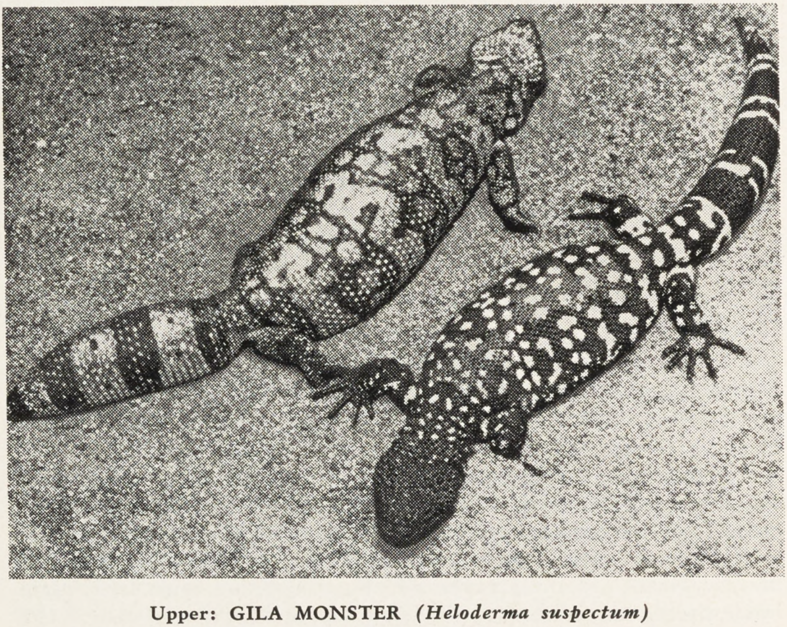
The pens that contain these lizard-like reptiles are at the west end of "A" Mesa. Each enclosure has a large tank of water and plenty of room for the animals to lie in the sun on the grassy bank.

Our Southern California climate is not well suited to the keeping of most reptiles outdoors throughout the year. Although it never gets really cold, the temperature is still not quite high enough during the winter months to meet the needs of most of them. The older specimens of crocodilians get along fairly well but the young must be brought inside during the colder months. We seldom display any except alligators.

In a pit just behind the Reptile House are displayed small alligators. These range in size from babies of a foot or less to young fellows three feet or more in length. When these have outgrown their nursery quarters they are put in the large pools at the west end of the mesa.

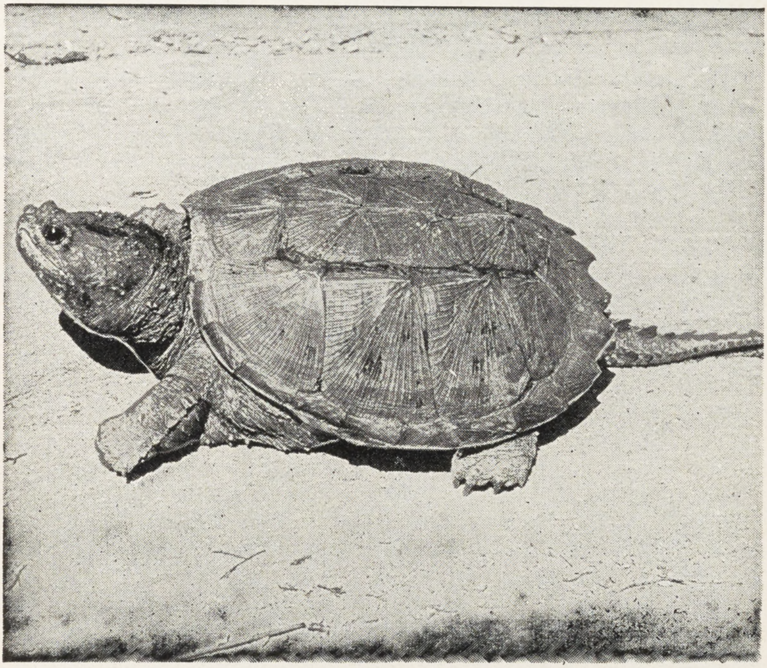
The large **Alligators** *(Alligator mississipiensis)* usually stop eating some time in October or early November and fast until the warmer weather of April or early May. The larger **Crocodiles** *(Crocodylus acutus)* eat all winter long but with little regularity. The **Caimans** (*Caiman fuscus*) eat a little whenever food is offered, not much, but usually enough to keep them through the winter. The frying-pan-headed crocodilians from India *(Gavialis gangeticus)* eat when they please but seldom enough to get through the cold months, even though they have built up a surplus of fat during the summer.

People often ask what is the difference between an alligator and a crocodile and usually add, "Which one is it whose upper jaw opens instead of the lower one?" The answer is somewhat involved. Scientifically there are but two alligators; that is, two crocodilians belonging to the genus *Alligator*. One is the alligator of the southern United States and the other is found in China. All other similar animals are also crocodilians but do not belong to the genus *Alligator*. All croco-



Upper: GILA MONSTER ***(Heloderma suspectum)***
Lower: BEADED LIZARD ***(Heloderma horridum)***

dilians are similar in structure and all open their jaws in the same way. In the United States the alligator is found throughout the Gulf States and has a very blunt nose. The United States crocodile is found only on the tip of Florida and has a pointed nose. However, some crocodiles in other parts of the world have a blunt nose and some a sharp nose. The various caimans throughout tropical America have moderately blunt noses.



SNAPPING TURTLE *(Chelydra s. serpentina)*

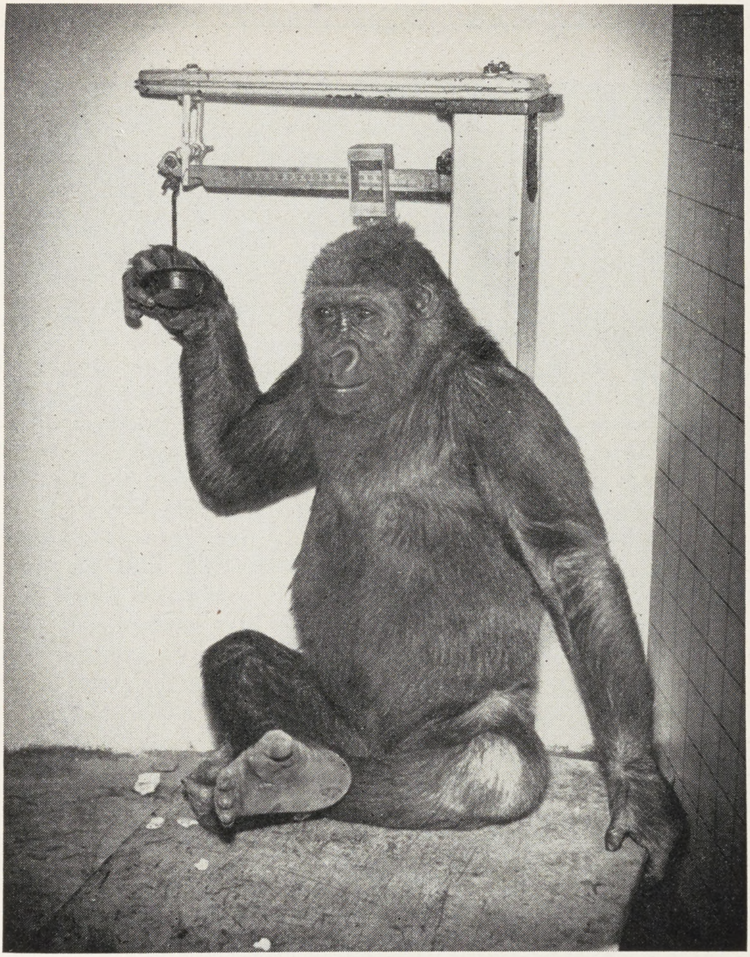
TURTLES

On the same mesa behind the Reptile House, separated by the lizard pits, are found the turtle pens. Twelve of these small enclosures are devoted to land turtles. Twenty or more different kinds of tortoises from all corners of the earth are on display. There are other pens for water turtles. Many of the fresh water turtles of the United States are represented, as well as a great number from foreign countries. **Alligator Snapping Turtles** *(Macrochelys temmincki)* weighing about one hundred pounds, eat several pieces of meat as large as grapefruit at a single meal. The **Australian Snake-necks** *(Chelodina* *longicollis)* have necks so long that the head and neck cannot be withdrawn in regular turtle fashion but instead must be folded sideways across the body between the upper and lower shell. Every year several species of turtles lay eggs and a great many baby turtles are hatched.

"What is the difference between turtle, tortoise, and terrapin?" is a common question. Answers differ, but usually "turtle" means either sea turtle or fresh water turtle; "tortoise" means land turtle, and the name "terrapin" is sometimes applied only to an edible turtle. There are so many exceptions that it would seem best to call all of them "turtles" and qualify where necessary.

The **Desert Turtles** *(Gopherus agassizi)* and several species of box turtle (Genus *Terrapene)* spend the winter outdoors with plenty of leafmold and earth in which to burrow during the hibernating period. The rest of the small land turtles are brought into the Reptile House where they have an artificial summer all winter.

Our prize turtle exhibit is displayed in a large enclosure at the south end of "A" Mesa. The majority of the specimens represent the **Giant Tortoise** *(Testudo elephantopus)* of the Galapagos Islands, while others come from Aldabra Island in the Indian Ocean and are called **Elephant Tortoise** *(T. gigantea)*. The largest specimen weighs just over 500 pounds. Because of its great size it is estimated to be 100 years old, but there is no way to determine the exact age of these tortoises. Some of the big fellows weighed from seven to eleven ounces when captured in 1934 and have now passed the 150 lb. mark. The giant turtles live outside all year but have a house in which to spend the night during the cold weather. As the temperature falls each afternoon, they slowly wander toward their house, and when the attendant goes down to close the doors at three-thirty p.m., most of the turtles are already in for the night.



LOWLAND GORILLA *(Gorilla gorilla)*

Primates

. . . "B" MESA . . .

MAMMALS

PRIMATES

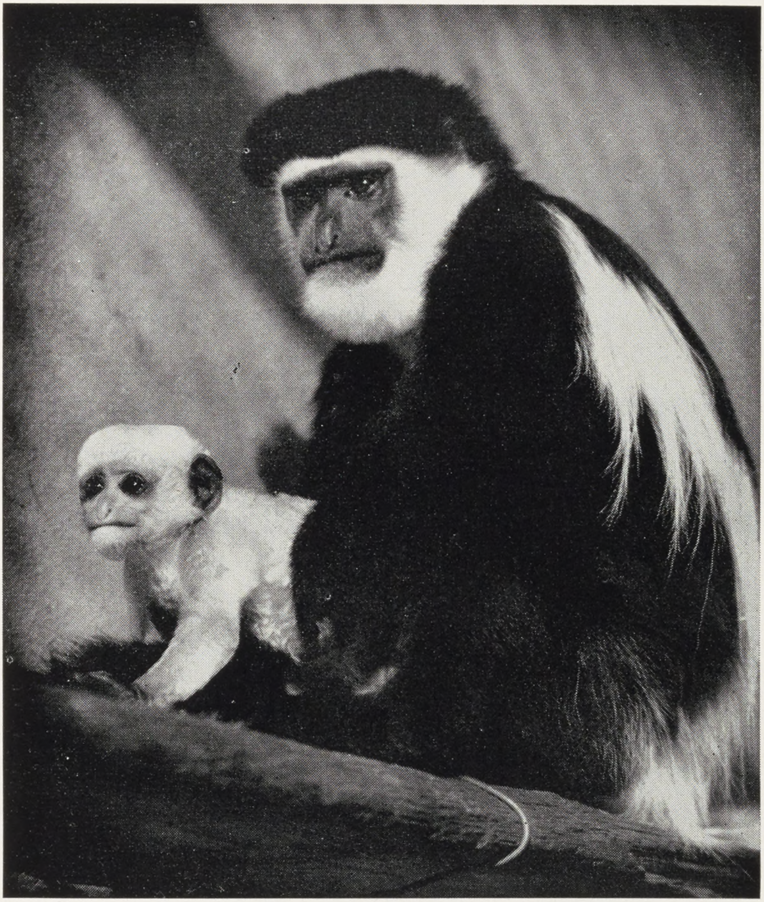
The large and comprehensive primate collection of the Zoological Garden of San Diego is all exhibited on B-Mesa, where it shares popularity with the bird collection.

In almost the center of this large area the group of cages built around a hollow square houses a large share of the monkey exhibit. These are comparatively small cages with larger arched cages in the center of three sides, the entrance gate in the corresponding position on the north side, and the four corner cages larger than the rest. The cages are equipped with swings, shelves on each side, wire tops and front, and sleeping and feeding rooms in the rear. These rooms are so arranged that they have an open front into what is called the service yard below the sleeping enclosure and there those monkeys which crave privacy or are cold in their shady front cages have sunshine and shelter and privacy in the back and can see their neighbors for entertainment. No animal is compelled to remain on exhibit continuously in the outer cage.

Most visitors reach the square at either the southeast or northeast corner. We try to exhibit the monkeys according to genera and geographical origin, but that is not always possible for certain monkeys need certain types of cages and exposures and we do not find it compatible with good sense to refuse to recognize this. Also large family groups needing more room are usually exhibited in the larger arched or corner cages.

African monkeys generally require a maximum of sunshine and warmth and are exhibited along the entire south side and the east and west cages immediately adjoining. Among the most rarely exhibited African Monkeys is the **East African Colobus** *(Colobus polykomos kikuyuensis)*, remarkable for its long white mantle and the huge tassel on its tail. Although this leaf-eating form is delicate, specimens have established longevity records here by thriving for more than twelve years.

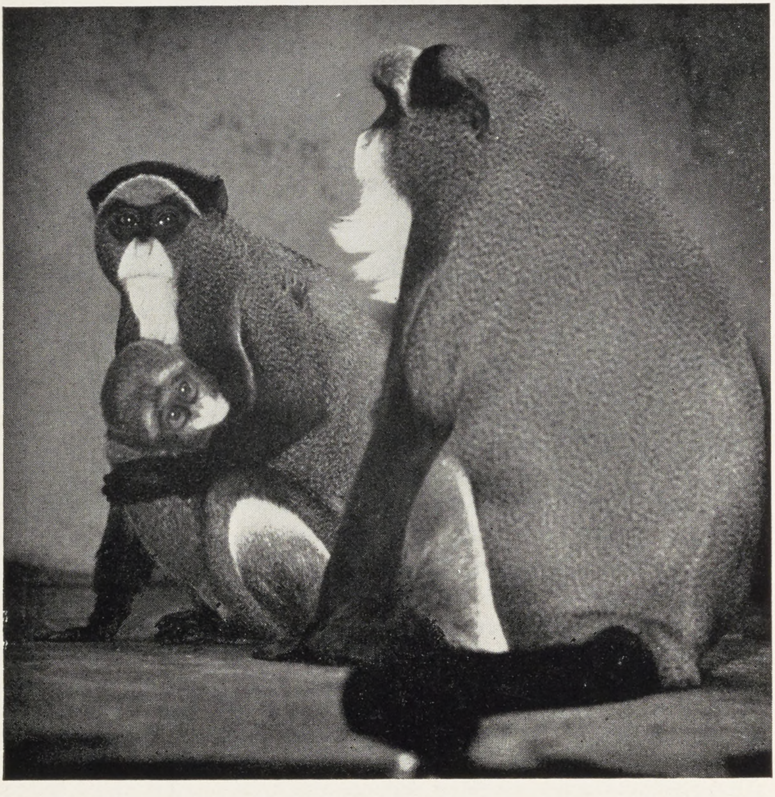
The **DeBrazza Guenon** *(Cercopithecus neglectus)*, equatorial Africa, another rarely seen in zoological collections, is characterized by an orange crescent on the forehead, a white upper lip and chin, mingled gray coat and small neat chin whiskers. Closely allied to this handsome rare fellow are two better known to the zoo public, the



COLOBUS MONKEY *(Colobus polykomos kikuyuensis)*

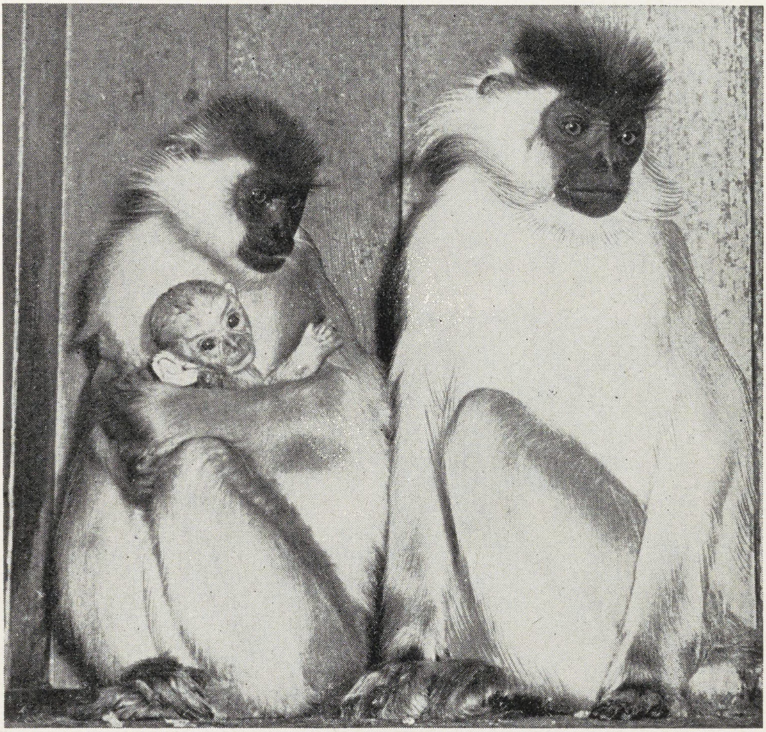
Spotnose Monkey *(Cercopithecus nictitans buttikoferi)* from West Africa, and another relative, the **Moustache Monkey** *(Cercopithecus cephus)*. The first of these is characterized by a large white spot of thick fur on its broad nose and the second by white skin on the lips. These are usually not very sturdy and yet two have lived here in our garden in out-of-door cages since 1929. To many, the handsomest monkey in the entire collection is the **Diana Monkey** *(Cercopithecus diana)* of West Africa. This trim monkey has a bright red band extending across its thigh, a dainty crescent of white hair above the brow, a solemn small black face, and a shapely black beard with a white edge.

All of the aforementioned are rare in collections and seldom born in zoos. However, both **Debrazza** and **Diana** monkeys have been bred here. Other species of guenons to be found in the San Diego collection include the **Beira** *(Cercopithecus mitis erythrarchus)*, **White-throated** *(Cercopithecus mitis kolbi)*, **Green** *(Cercopithecus aethiops sabaeus)*, **Johnston's Vervet** *(Cercopithecus aethiops johnstoni)*, **Mona** *(Cercopithecus mona)*, **Patas** *(Erythrocebus p. patas)*, and **Nisnas** *(Cercopithecus patas pyrrhonotus)*. With the exception of the **Patas** and **Nisnas** which have wiry, carrot-colored hair, the guenons are characterized by soft, grizzled olive or yellowish coats. All guenons are native to Africa.



DEBRAZZA GUENON *(Cercopithecus neglectus)*

Another group of African monkeys is the mangabey clan. These are strange large monkeys with long straight tails, thick dark gray coats of soft silky hair, and many of them have white eyelids. They grimace at you by blinking these white lids and raising their brows. The handsomest of these is the **Cherry-headed Mangabey** *(Cercocebus t. torquatus)* from West Africa. As their name indicates the hair over the top is very red with a crest which stands up conspicuously.



ASSAM LANGUR *(Trachypithecus pileatus)*

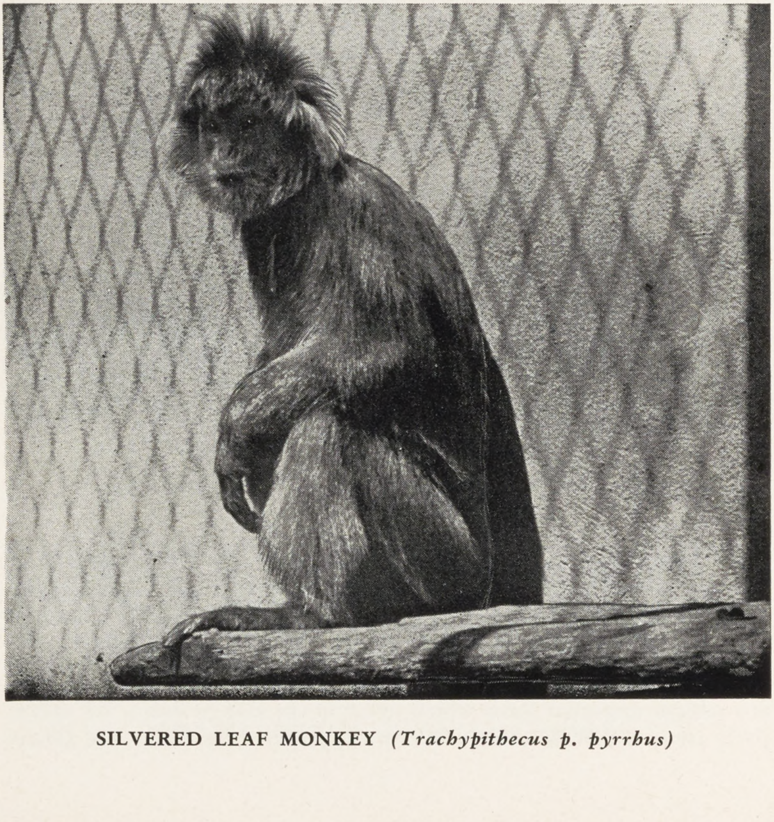
The closely related **Sooty Mangabey** *(Cercocebus t. atys)*, also of West Africa, is less colorful, having a coat of uniform gray with only the white of the eyelids for contrast.

The **Golden-bellied Mangabey** *(Cercocebus galeritus chrysogaster)* is a seldom imported form which inhabits the Congo Basin. Its underparts are rich gold in color while the upperparts are olive. The **Gray-**

cheeked Mangabey *(Cercocebus albigena)*, which also inhabits the Congo Basin, is black and gray. Many young of this species have been born in the collection.

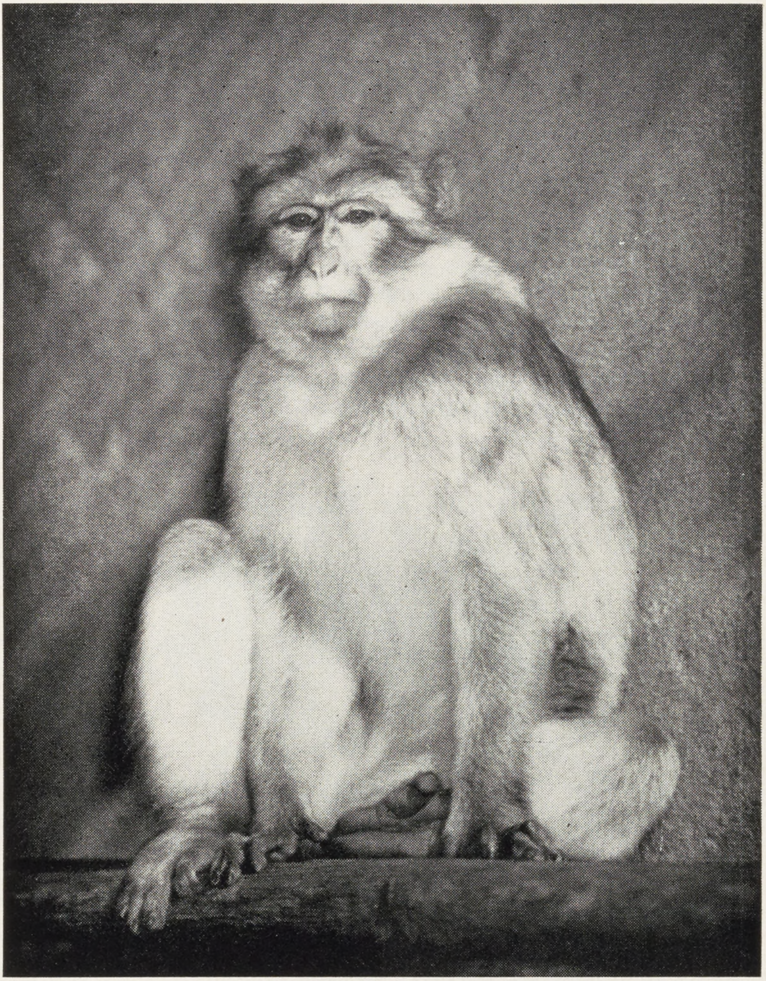
While not so well represented in our zoo as the African monkeys, there are still several species of the rarer of Asiatic monkeys. Specimens from that continent are exhibited for the most part on the western and eastern exposures of the monkey square.

Monkeys of the langur group are characterized by slender bodies, long limbs and tails, and wistful, oriental faces. They live largely on leaves, fruit and vegetables. Their stomachs are equipped with sacs in which great masses of food can be hastily stored in a partially digested form and later assimilated, just as other types of monkeys feeding hurriedly store food in their cheek pouches. As is the case with all other Old World monkeys, the tail of the langur is used solely as a balancing organ and has no grasping or clinging powers. Langurs are closely related to the Colobus monkeys of Africa.



SILVERED LEAF MONKEY *(Trachypithecus p. pyrrhus)*

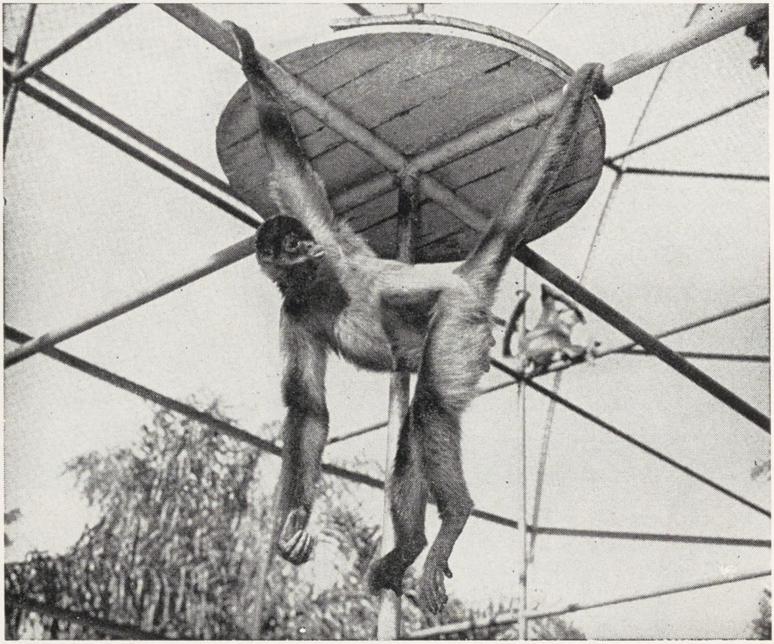
Included in the langur exhibit are two species of the gray coated monkeys. Both are large, long-legged creatures of an even, soft gray coloration with black faces, hands and feet. Their fur is coarse and lacks an undercoat. Of these two the **Entellus** *(Trachypithecus entellus)* is better known and more frequently exhibited. The second and rarer, the **Bonneted Langur** *(T. pyrrhus pileatus)* from the hill country of northern Assam, differs from the first by having a black patch on the belly and a black cap. A third member of the langur group is the



BARBARY "APE" *(Macaca sylvanus)*

Silvered Leaf Monkey *(T. p. pyrrhus)*, a species which is widely distributed through southeastern Asia and the islands of Sumatra, Borneo, Java, Bali, and Natuna as well. **Germain's Leaf Monkey** *(T. pyrrhus germaini)* of Siam is silvery gray with white cheeks. Another kind of Asiatic leaf monkey exhibited here is the **Spectacled Langur** (*T. obscurus*), so-called because of the white rings around its eyes.

Among the best known of the monkey tribes is that of the macaque. The word itself means monkey in various of the Indian dialects and is applied to a large family of monkeys which range from China and Japan south and to the west through most of southern Asia and the East Indies. Characteristics of the individual species vary considerably, but fairly consistent throughout the macaques is the stocky build and naked face. Familiar to all zoo visitors are the **Red-faced Macaques** *(Macaca fuscata)* of Japan. During anger or excitement of any kind, the red color deepens on their faces and ischial callosities. Their tails are short, their general color tawny gray. They grimace at each other and will, with a little coaxing, make horrid faces at the crowd.



MEXICAN SPIDER MONKEY *(Ateles geoffroyi)*

The **Short-tailed Macaque** *(Macaca speciosa)* is a recent importation. It is from Northern India. Another nearly tailless macaque is the **Barbary Ape** *(Macaca sylvanus)*, native to North Africa and introduced on Gibraltar.

The **Rock Macaque** *(Macaca cyclopsis)* is the only monkey native to the island of Formosa. It has a long tail, a thick coat, and a shell pink face.

The rarest of our macaque group are the **Crested Macaques** from the Celebes *(Macaca nigra)*. They are jet black, growing a little slaty with age, have dull soft black faces with high cheek ridges almost like a baboon, and tiny rudimentary tails, so are often loosely and most improperly called apes. They have ragged crests which during moments of excitement they raise and lower rapidly.

From the same region comes the macaque often called the **Moor Macaque,** or the **Celebes Ape** *(Macaca maura)*. They are larger, heavier than the crested macaques and lack the crest. Their fur varies from dark gray to a chestnut brown. Ours have produced many young.

Other macaques that have been shown here include the **Long-tailed** or **Crab-eating Macaques** *(Macaca fasicularis)* of southeastern Asia, Indonesia, and the Philippine Islands; the commonly exhibited and highly popular **Malayan Pig-tail** *(M. nemestrina adusta)* and the rarer **Burmese Pig-tail** *(M. n. andamensis)*; the **Rhesus Macaque** *(M. mulatta)* of India; and the spectacular **Wanderoo** or **Lion-tailed Macaque** *(M. silena)* also of India. The last named species is black with a heavy gray mane and has a tassel on its tail.

Of the many kinds of New World monkeys, perhaps the best known are the *Cebus* monkeys. Although sometimes called "Ring-tails," they are usually designated as Capuchins, with a modifying adjective based on color to indicate the species. They are the monkeys which were customarily used by the old-time organ grinder. They carry their tails rolled under in a loose ring, hence the name "ring-tail." The tails are prehensile, though not so suited for grasping as those of certain other American monkeys. Capuchins carry their young jockey-style on their backs.

Most commonly exhibited is the **White-throated Capuchin** *(Cebus capucinus)* of Central America. Several other forms have been exhibited here, all of tropical South America: the tan-coated **White-fronted Capuchin** *(C. albifrons)*, the **Weeper** or **Brown Capuchin** *(C. fatuellus paraguayensis)*, and the droll **Smooth-headed Capuchin** *(C. f. variegatus)*, the largest of this dainty tribe. While the **Weeper** has a crested cap, the last has a large smooth round head with short hair standing on end back to the crown.

Woolly Monkeys are among the most attractive of New World monkeys. Their prehensile tails possess considerable clinging power; their bodies are short and their legs short and thickly covered with fine thick fur that stands up like chenille. The ones on exhibit here are **Humboldt's Woolly Monkey** *(Lagothrix lagotricha)* and the **Brown Woolly Monkey** *(L. infumata)*, both of tropical South America. **Howlers** *(Alouatta)*, large but delicate monkeys from the American tropics, are also sometimes to be found here.

The most fantastic and clownish of the American Monkeys is the **Spider Monkey.** They are exhibited in a large arched cage provided with high bars and trapeze in the form of a real maze. Their progress through these bars with the aid of their strong prehensile tails is at once ludicrous and amazing. Several species and sub-species are exhibited together. The scientific name *Ateles,* meaning imperfect, takes note of their lack of a thumb on the hand. Several babies have been born in the zoo during the last six or seven years.

Surrounding the spider monkey cage on the extreme edge of B-Mesa is a series of smaller arched cages which house various of the smaller primates of both New and Old World origin. This series of cages usually contains representatives of the more primitive primates such as the **Slow Loris** (*Nycticebus coucang*) of southeastern Asia, the **Great Galago** (*Galago crassicaudatus*) of East Africa, or the **Ring-tailed Lemur** (*Lemur catta*) of Madagascar. Many of the smaller forms of American monkeys are also to be seen here, among them the beautiful sakis of tropical South America: the **Black Saki** (*Pithecia satanus*), the **Hairy Saki** (*Pithecia pithecia monacha*), and the **Golden-headed Saki** (*Pithecia pithecia chrysocephalus*). The **Squirrel Monkey** (*Saimiri sciureus*) and the nocturnal **Owl Monkey** (*Aotus trivirgatus*) are two other kinds of treetop primates from the New World tropics. The marmosets are the smallest of American monkeys and many forms have been shown here: of these, the **Black-tailed** (*Callithrix argentata*), the **White** (*Callithrix melanoleuca*) and the **Pied** (*Leontocebus bicolor*) are perhaps the rarest. Among others, the **Pigmy** *(Callithrix pygmaea)* and the **Lion Marmoset** *(Leontocebus rosalia*) have bred and reared young here.

Because some persons consider baboons repulsive and few find them as interesting as the other primates, the baboons have been exhibited in a series of cages across the service road behind the anthropoid apes, and facing northward. Because of their great curiosity, their comical activity, and interesting family groups, baboons have always been a favorite with the zoo staff. They can usually be seen up over the top of their cages peering into the ape cages and service road, wondering what is going on. The baboon group in San Diego is composed of **Doguera** *(Papio anubis)*; **Sphinx** or

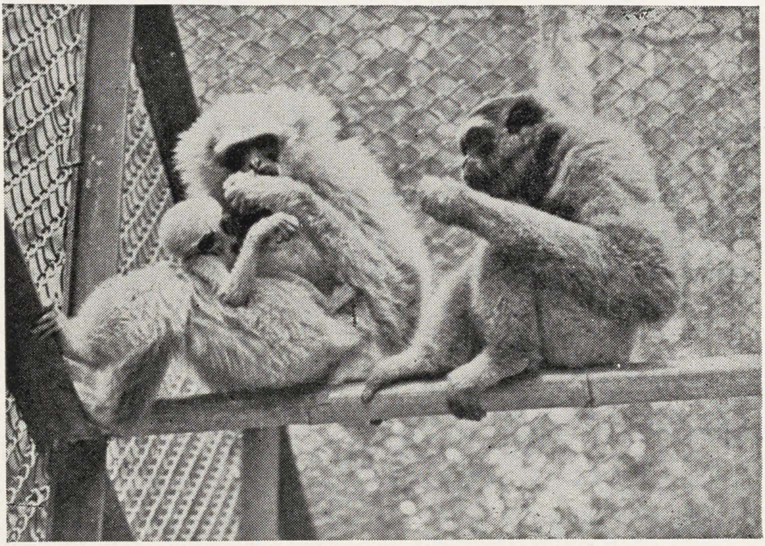
GELADA *(Theropithecus gelada)*

Guinea *(Papio papio)*; **Chacma** *(Papio porcarius)*; and the **Long-armed** *(Papio cynocephalus)*, with extremely long arms and tail. The **Hamadryas** *(Comopithecus hamadryas)* is a closely related monkey native to northeast Africa and Arabia while two other baboon-like creatures, the **Mandrill** *(Mandrillus sphinx)* and the **Drill** *(Mandrillus leucophaeus)* inhabit the forests of West Africa. They are large and handsome beasts with extremely short tails and highly colored flesh about the face and rump. The **Gelada** *(Theropithecus gelada)* of Ethiopia is a mountain form characterized by a dark mane and a naked red patch on the chest. The baboons and their allies may be distinguished from the other primates by their dog-like snouts and characteristic postures. They walk flat-footed on all fours and are fearless, fierce, and generally dangerous upon reaching maturity.

The entire anthropoid ape collection is exhibited in a series of five extra large cages facing south to the right of the main road around B-Mesa. They lie on the north side of the mesa across the drive from the Monkey Square and Parrot Square.

DO NOT FEED. The San Diego Zoo is indulgent with its visitors in the matter of feeding privileges. Only such cages as are marked with signs **DO NOT FEED** are in the restricted class. And yet we have trouble with adult visitors who try to sneak food to these animals, perhaps to see if something tragic will happen. The danger in feeding is *not* an immediate danger of injury, especially from the food itself, but the danger of contagion of pulmonary and blood diseases to which these man-like apes have no resistance. We feel it is a small and contemptible person who will break that rule. Children practically never do.

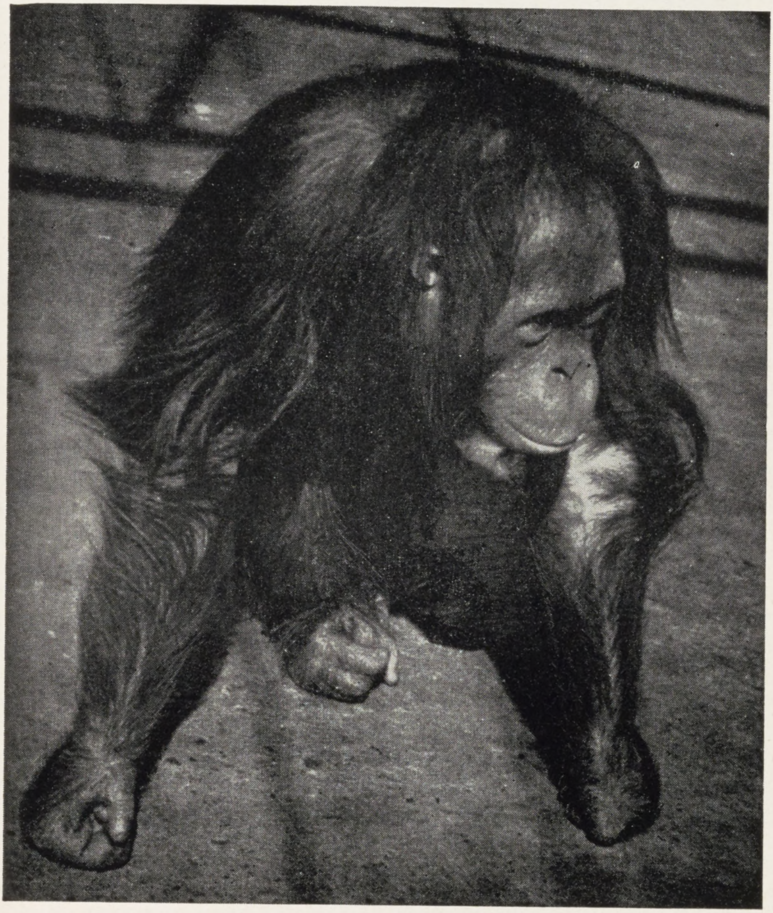
The Gibbons are the smallest of the anthropoid apes. Their scientific name *Hylobates* means walking in the trees, and from the performance you will see on the high bars and wires in the cage you will consider it justified. Gibbons, native to a wide area in tropical Asia, range on the mainland from Indo and Cochin-China south to the tip of Malaya, and in the small and large islands which make up the East Indies, including Sumatra and Borneo. Several species of gibbon have been exhibited in the zoo during the past twenty years. Unfortunately, gibbons are extremely intolerant of each other and a mated pair will not endure the presence of any other gibbon in the same cage. They are fierce and persistent fighters. Their long, needle-like canine teeth can cut a jugular vein with one strike and many of our gibbons have been lost due to just such injuries. The **White-Handed Gibbon** *(Hylobates lar lar)* of India and Malaya (both light and dark phases) and the **Pileated Gibbon** *(Hylobates lar pileatus)* of Siam and Cochin-China are usually to be seen here, and



GRAY GIBBON *(Hylobates moloch)*

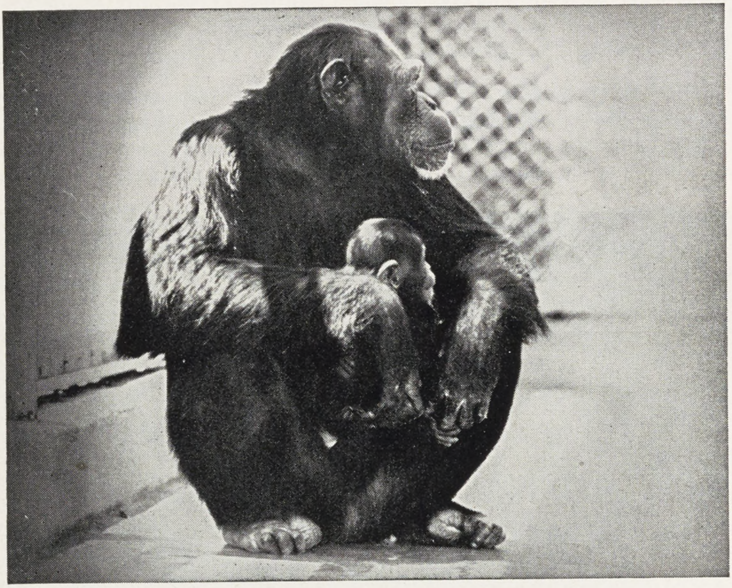
from time to time other forms may be exhibited: the **Gray Gibbon** *(Hylobates moloch)* of Borneo and Java, a species which has bred and reared young here; the **White-Cheeked Gibbon** *(Hylobates concolor leucogenys)* of Siam, the spectacular **Hoolock** *(Hylobates hoolock)* of Assam, the **Agile Gibbon** *(Hylobates agilis)* of Sumatra, and the large black **Siamang** *(Symphalangus syndactylus)* of Sumatra and Malaya.

The division in the gibbon group is between the ordinary gibbons and the **Siamang,** *(Symphalangus syndactylus)* the pouched gibbon. It is larger than the others, more active, and characterized by a laryngeal sac which can be inflated at will. The throat sac produces a weird and



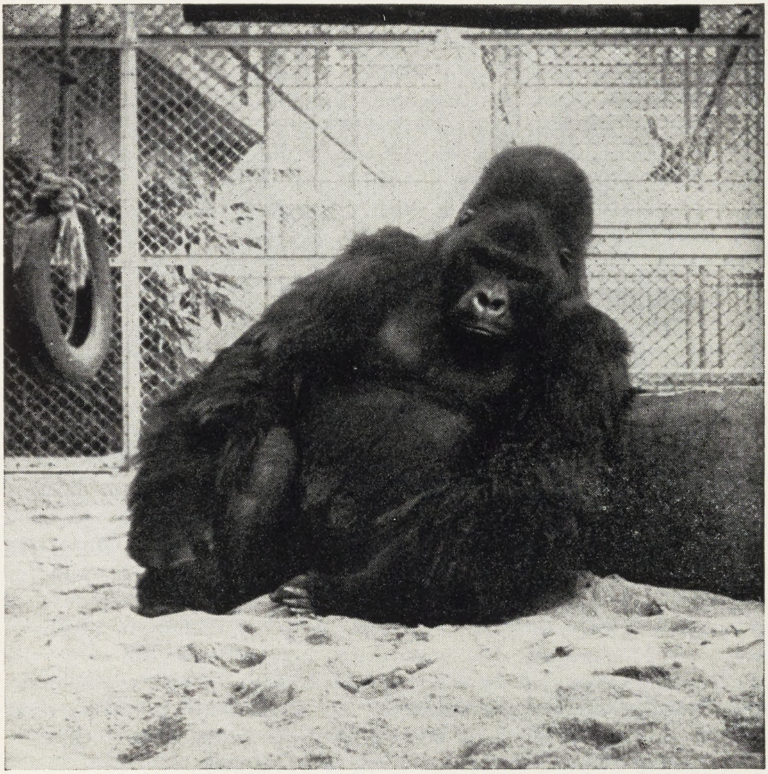
ORANG-UTAN ***(Pongo pygmaeus)***

resonant double-toned cry. All gibbons are active and noisy, but the song of the others is bell-like, full, and sweet in its tones. Gibbons travel by means of their long arms, with which they swing from branch to branch, but they also throw their whole bodies for distances of fifteen to twenty-five feet through the air from tree to tree.



CHIMPANZEE *(Pan troglotydes)*

The **Orang-Utan** is one of the larger great apes, found in territory overlapping with the gibbon, but entirely confined to Sumatra and Borneo. Although often put into two groups or species, there are some who deny any division and call all Orangs *Pongo pygmæus*. The common name, Orang-Utan, which is taken from the native tongue, means man-of-the-wood and was at one time applied to all anthropoid apes. Their color is reddish brown, ranging from a real sorrel to a deep auburn. The hair is long and coarse. Their arms are longer than their bodies and legs when standing erect. Their gait on the ground is a shambling whirling motion in which they use their long arms as crutches, bearing their weight on the second joints of the fingers. Both hands and feet are very long, with tiny thumbs and tremendously long strong fingers with curved nails. Their toes are somewhat shorter than their fingers, and in some Orangs the great toe is rudimentary. The foot, like the hand, is a grasping organ of great strength. Both the Orang and the Gibbon carry food or treasures in their feet, leaving their hands free



MOUNTAIN GORILLA *(Gorilla berengei)*

to use in their movements through the trees, for these great beasts which attain a weight of more than one hundred and fifty pounds also move much more easily through the trees than on the ground. They build substantial nests in crotches of trees, to which they return for several months. They are clever with tools and instruments, natural engineers and systematically destructive in their cage, which necessitates everything being built with great strength and substantially padlocked.

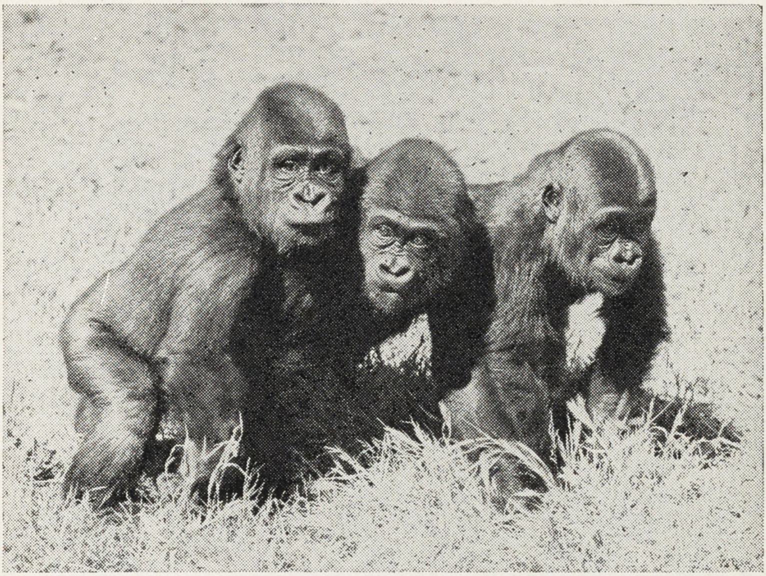
The **Chimpanzees** *(Pan troglotydes)* are the best known of the four anthropoid apes. They are intelligent, imitative, and the most adorable babies when young. Maturity usually finds them dangerous and erratic, although reported exceptions are common. They are shorter, more compact animals than the orang-utans. They are found through western tropical Africa. Although chimpanzees are usually considered ground dwellers they are apparently equally at home off the ground and travel through trees and on their bars in the zoo with great agility. They are black in infancy, becoming gray with age. Their hair is coarse and long, but not so long and ill-kempt looking as the long tangles of red hair hanging from the back and thighs of the orang. Their food, like that of the other apes, is largely vegetarian, although they will accept meat on occasion and they like eggs and do often catch and eat wild birds which fly into their cage. Their natural gait on the ground is on all fours, like that of the orang, but like other great apes they can easily be taught to walk erect when young. Several have been born here.

The Gorilla is generally physically, if not mentally, considered closest kin to man in the animal world. They, like the chimpanzee, come from Africa and are divided into two species, the **Mountain Gorilla** *(Gorilla berengei)* and the **Lowland** or **West Coast Gorilla** *(Gorilla gorilla)*. Gorillas are black in their youth, with varying gray or black and white hair patterns as they grow into maturity. The "white saddle" of the Mountain Gorilla is well known to observers and readers of gorilla lore.

Gorillas are the largest of the great apes, the males attaining a known weight of five hundred pounds in the wild. Two male **Mountain Gorillas** in the San Diego zoo attained a weight of over six hundred pounds before reaching full maturity. Mbongo, the younger one, died after ten and one-half years in the zoo and after reaching a weight in excess of 618 pounds. His cage mate, Ngagi, somewhat older and without any excess fat nor the enormous abdomen which characterizes many gorillas, reached the weight of 635 at his death in 1944. These gorillas were captured by the Martin Johnsons in the autumn of 1930 when they were probably between four and five years old.

Five specimens of **Lowland Gorilla** have been exhibited in the San Diego Zoological Gardens. The first two of these, both females, were found to be heavily parasitized upon their arrival in 1941. One died almost immediately while the other survived for several years. In 1949, three infant specimens, Albert, Bata, and Bouba, were obtained from Cameroon with special permission from the French government. They were all under a year old at that time and weighed between six and eight pounds each.

Gorillas, like chimpanzees, travel preferably on all fours, bearing their weight on the second joints of their fingers and the flat foot. Their feet are much less flexible than those of the chimpanzee, much less a grasping organ, and both feet and hands are much more in proportion to those of man. Our gorillas have been strictly vegetarians, refusing all forms of meat we have offered them. Their food is coarse and green but they eat enormous quantities and are greedy and jealous of food offered to apes associating with them. When they do stand erect



LOWLAND GORILLA *(Gorilla gorilla)*

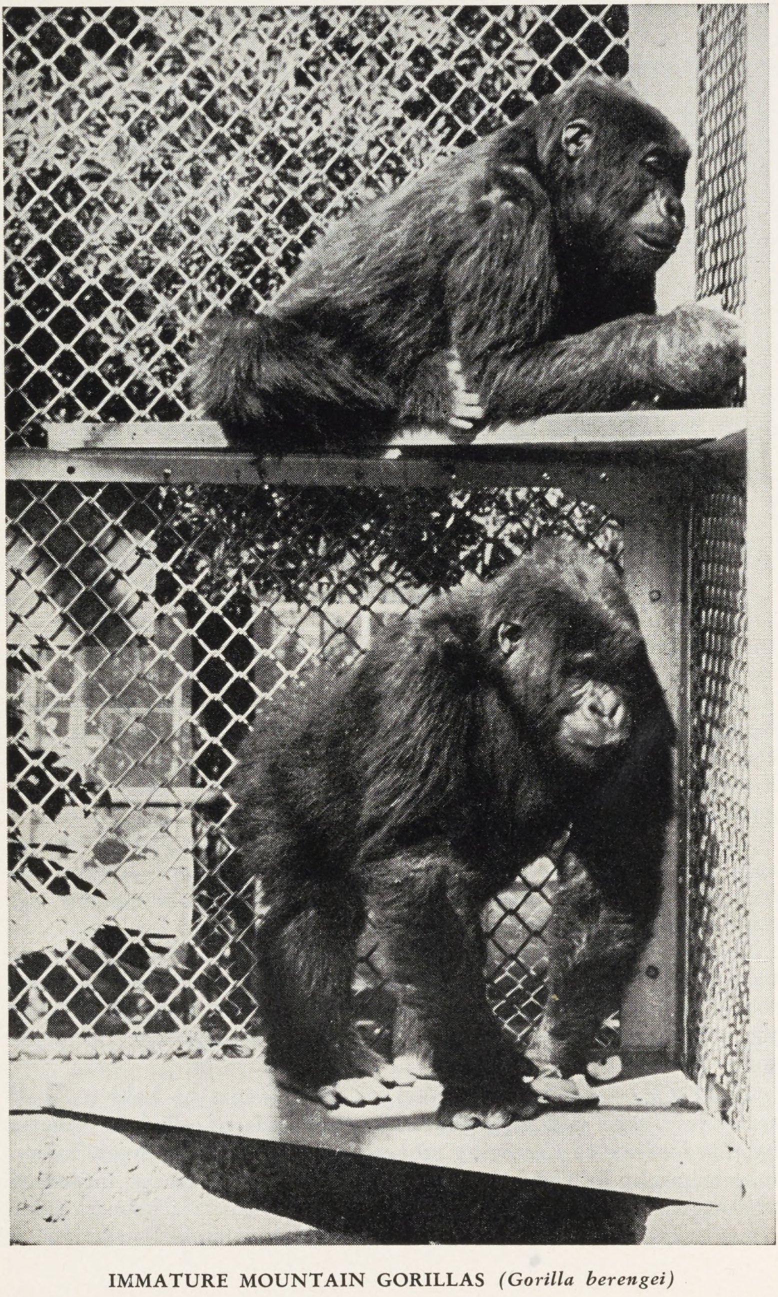
they are very erect, carrying their arms at their sides and stepping on the flat of the foot.

Perhaps the gorilla habit which has intrigued people most is chest beating. This is undoubtedly an expression of well being, excitement, and something of a challenge to play or respond. In the deep jungles it may be used as a signal to keep the members of the troups in which gorillas appear to live in contact with each other.

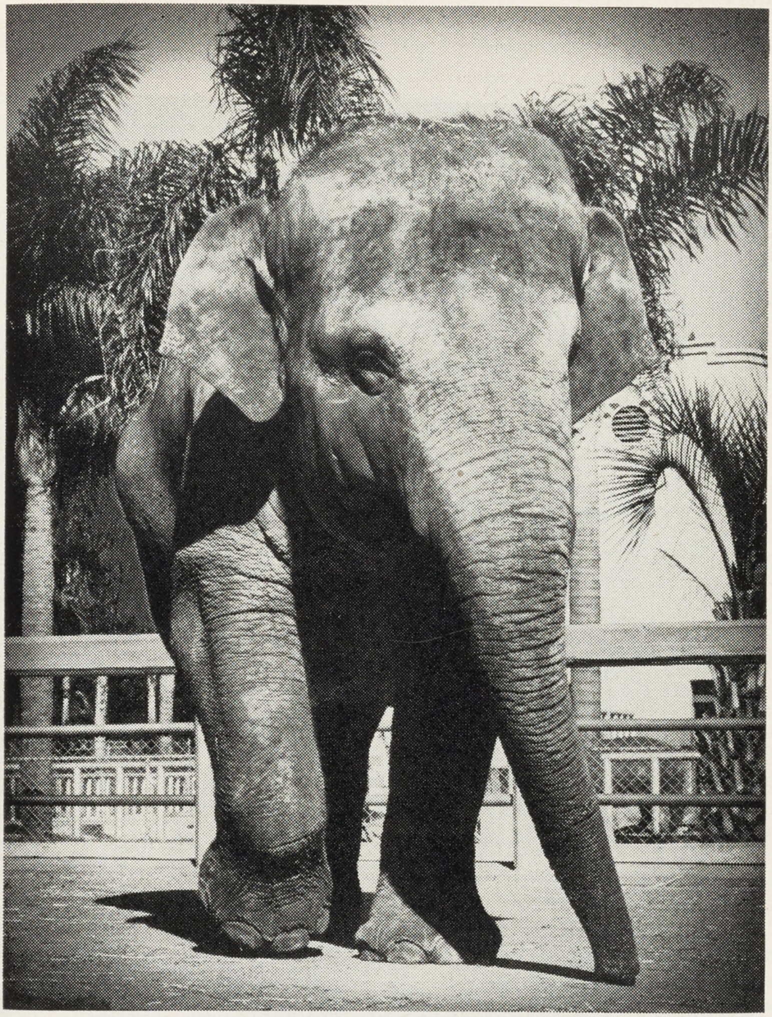
Gorillas are vocally quiet but have pleasant, rather singsong voices and offer a wide range of vocalizations when so inclined. In temperament they are much less excitable and erratic than chimpanzees and much less stoical than orang-utans.

Gorillas are scarce both wild and in captivity. They should be protected against destruction by most energetic means, and they especially should be guarded against infection from human beings. Emphasis upon the importance of attempting to breed them in captivity cannot be too great.

NOTICE: Again we appeal to our visitors to help us protect these rare and magnificent anthropoids of all four species by not feeding or throwing stones or clods into the cages. Every missile might be the bearer of death in some form of infection or fungus.



IMMATURE MOUNTAIN GORILLAS *(Gorilla berengei)*



INDIAN ELEPHANT *(Elephas maximus)*

Heavy Mammals and Rodents

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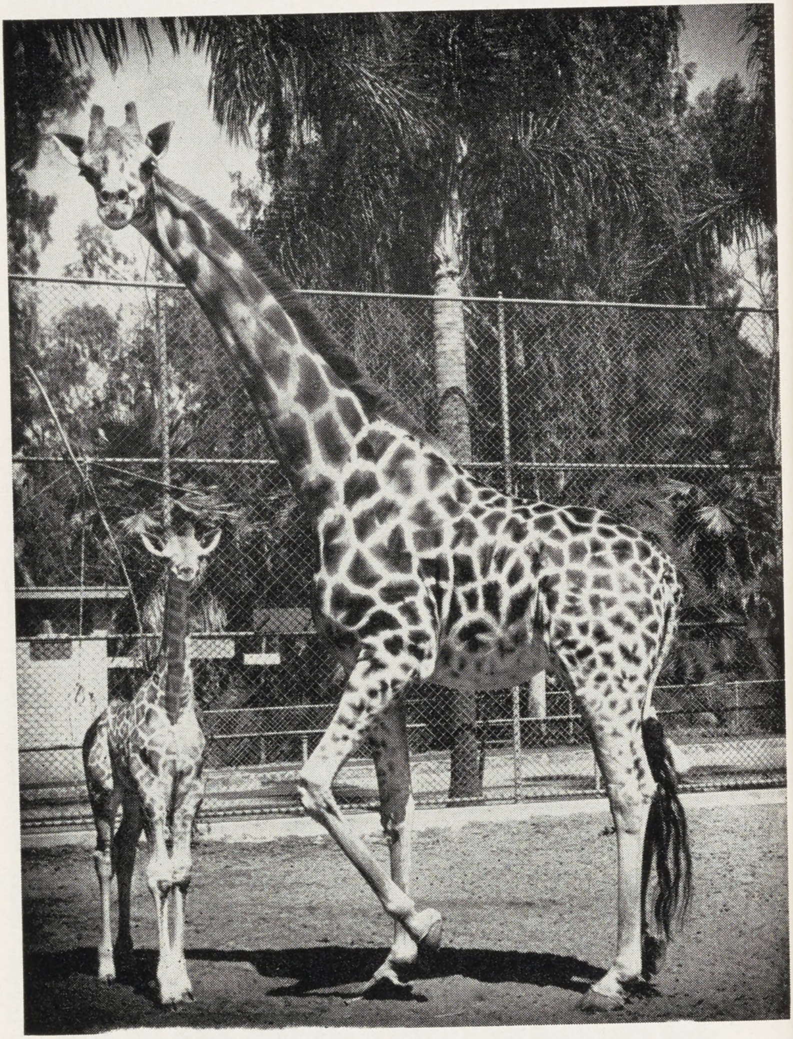
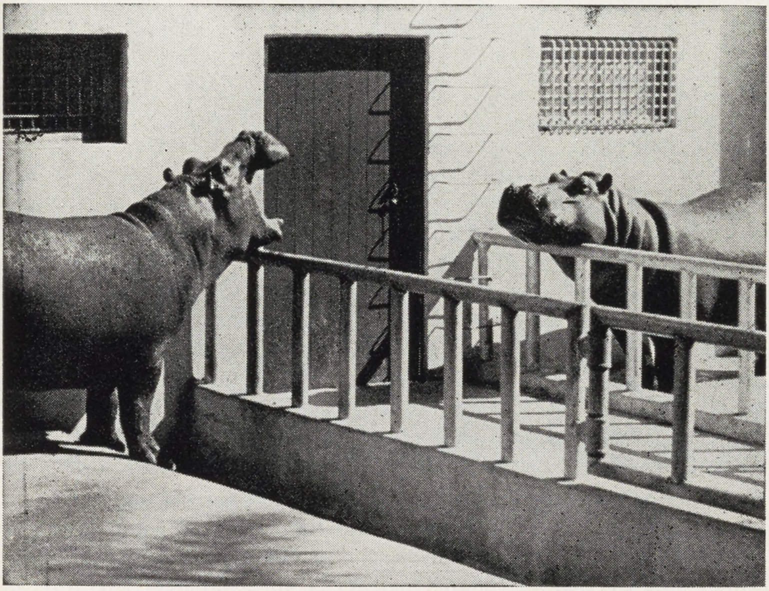


UGANDA GIRAFFE *(Giraffa camelopardalis rothschildi)*

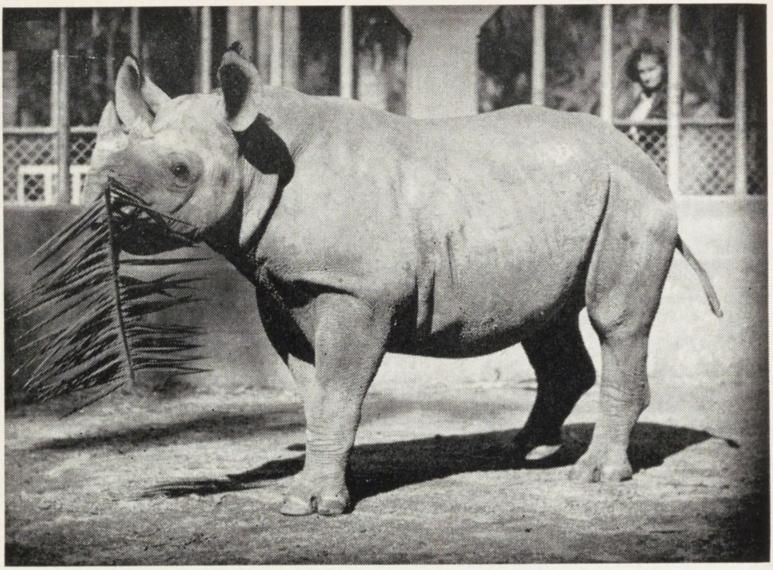
HEAVY MAMMALS, RODENTS AND MARSUPIALS

One of the most attractively landscaped sections of the zoo, C-Mesa, like each of the others, is plotted as a loop which at the eastern extremity adjoins roads from B- and D-Mesas and F-Canyon. In the center of the loop are three enclosures containing large tile-roofed houses. The first enclosure is divided into three parts, which are occupied by the giraffes; the second into four parts, for hippos; and the third (at the west end) into two sections for the elephants. On the north side of the loop are long pens intended for the display of tapirs. On the south side are stockades for rhinos and Pigmy Hippos.

Extending along the drive which curves northward from the giraffe paddocks are enclosures for camels and their relations. Directly across from the camels is a series of arched cages surrounding two large,



HIPPOPOTAMUS ***(Hippopotamus amphibius)***



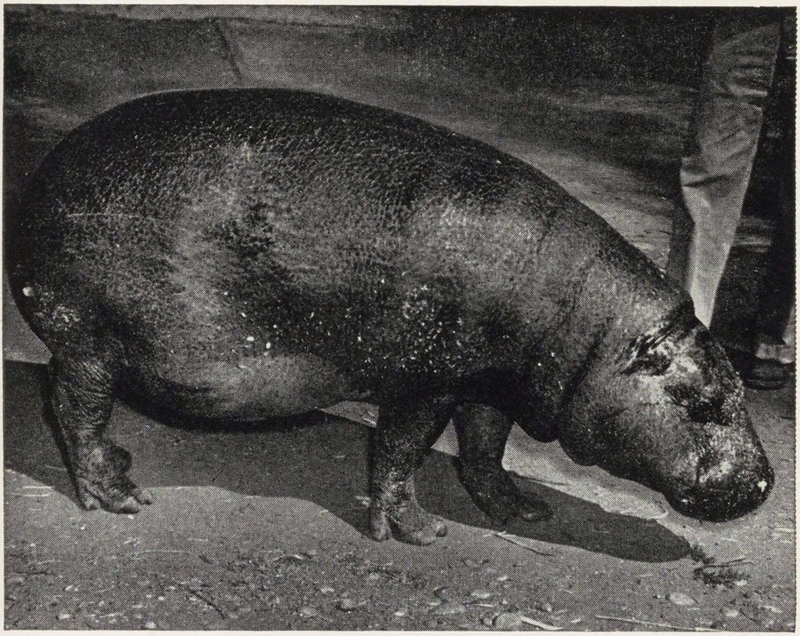
AFRICAN BLACK RHINOCEROS *(Diceros bicornis)*

central pens. Here are to be found various species of small mammals.

The visitor upon arriving at C-Mesa usually visits first the giraffes of which there are several specimens exhibited. The scientific classification of these long-necked beasts differs considerably from time to time; however, the present trend seems to be to combine all types into a single species which is divided into twelve subspecies or geographical races. The family to which they belong contains only one other species, the rare Okapi of the Belgian Congo. Both animals are characterized by hair-covered horns but the Okapi lacks the long neck and the spotted pattern of the Giraffe. Our giraffe belongs to the race known as the **Uganda Giraffe** *(Giraffa camelopardalis rothschildi)*, native to East Africa. "Lofty" and "Patches," our original pair, arrived in San Diego in October, 1938, after a two month boat trip from Mombasa, Africa, and a journey by truck across the United States from New York. At that time, they stood about eleven feet high, the male being slightly shorter than the female. Judging from the growth of young born here, they could not have been more than two years old. The first calf was born to this pair late in March, 1942, which would indicate that the giraffe matures at approximately five years of age. The **Reticulated Giraffe** *(G. reticulata)* has also been shown here.

The **African Black Rhinoceros** *(Diceros bicornis)* has a most formidable reputation; it charges without apparent provocation. This characteristic is probably due, however, to poor sight and a resulting feeling of insecurity rather than to viciousness. The Black Rhino has been so persistently hunted that it is rapidly disappearing from the brush and forest lands in which it was once common. Rhinos are browsing animals, feeding entirely on vegetable matter. Their nearest living relatives are the horse and the tapir.

Second largest of land mammals, the **Hippopotamus** *(Hippopotamus amphibius)* inhabits the rivers and lakes of Africa. For the most part it is a peaceable and inoffensive creature, although when angered or frightened it can prove a formidable adversary. Several young have been born here, each in a shallow pool constructed as a nursery in the southwest corner of the hippo house. There the young are born and remain for the greater part of each day until the mother decides to wean them.



PIGMY HIPPOPOTAMUS *(Choeropsis liberiensis)*

The **Pigmy Hippopotamus** *(Choeropsis liberiensis)* from West Africa is not as large as a six-month-old Nile Hippo. If it were not for its enormous mouth and the general clumsy build it might be mistaken for a hairless swine. These creatures live in the deep forests of Liberia, are quite solitary and are considered dangerous animals in zoos. They are not so completely amphibious as their giant cousins. A full grown pigmy weighs about four hundred pounds as contrasted with three or four tons for the big hippo.

The pen which houses the elephants is divided into two sections: one for general living purposes and the other, which contains a large tank, for bathing on warm summer days.

The **Indian Elephant** *(Elephas maximus indicus)* of tropical forested Asia is the species which is most frequently seen in zoos and circuses. The **African Elephant** *(Loxodonta africana)*, which occurs throughout Africa south of the Sahara, is much rarer in captivity. The African Elephant is larger and more lanky than its Indian cousin and its ears are much greater in size. Contrary to general belief, the African Elephant is no more difficult to train than the Indian; it has proved quite tractable at experimental training stations in the Belgian Congo.

KOALA *(Phascolarctos cinereus)*

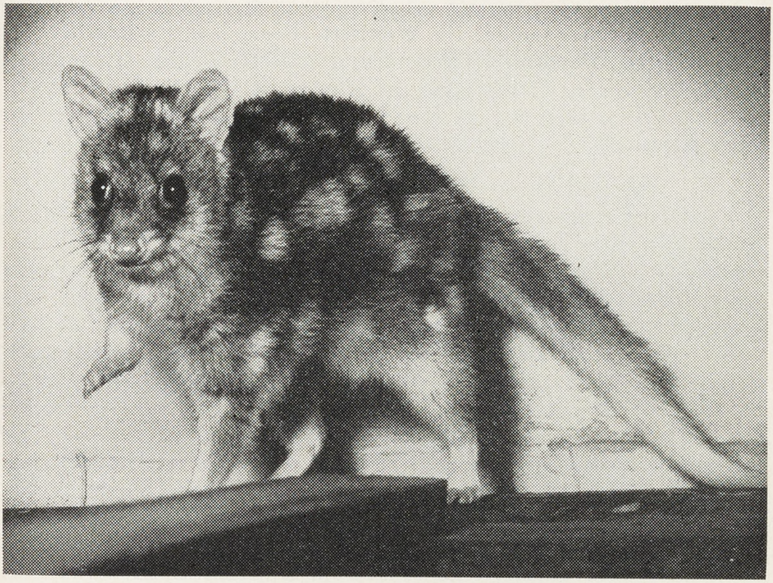
Pens intended primarily for the exhibition of tapirs occupy the north side of the C-Mesa. These, however, are versatile pens and can be used to house large rodents, the Pigmy Hippopotamus, or wallabies and kangaroos when not in use as tapir pens.

Of the four species of tapirs to be found in the tropical regions of America and Asia the zoo has exhibited three species, the **Baird's Tapir** *(Tapirus bairdii)* the **South American Tapir** *(Tapirus terrestris)* and the **Malay Tapir,** called the "Saddle-backed Tapir" *(Tapirus indicus)*. While the tapirs are related to the horse and the rhinoceros, their habits are much more like those of the Common Hippopotamus. They are largely aquatic and feed on water plants.

MARSUPIALS

Eventually the exhibit of Marsupials or Pouched Mammals will be housed in a section of their own but for the present they are to be found on C-Mesa in the pens which face the giraffe and hippopotamus enclosures.

With the exception of the familiar **American Opossum** *(Didelphis virginiana)* and a few related species in Central and South America, the Marsupials are restricted in distribution to the New Guinea-Australian region and the nearby islands. They are represented by varied and contrasting forms, the most familiar of which are the kangaroos and the Koalas. Many forms of kangaroos have been exhibited here, and the collection usually contains specimens of the following: the **Red Kangaroo** *(Macropus rufus)*, the **Wallaroo** *(Macropus robustus)*, and



NATIVE "CAT" *(Dasyurus quoll)*

the **Agile Wallaby** *(Macropus agilis)* of Australia and the **Tasmanian Gray Kangaroo** *(M. tasmaniensis)* and **Bennett's Wallaby** *(M. ruficollis bennetti)* of the island of Tasmania. The term "wallaby" is applied to small forms of kangaroo and "wallaroo" to medium-sized kangaroos with woolly coats.

We have had excellent success in breeding and raising kangaroos as have other American zoos for most species are hardy and prolific. The new born is seldom seen, the process of birth occurring when the baby is yet quite underdeveloped. At that time the minute creature finds its way to the pouch, apparently without help from the mother, and there fastens itself upon the nipple, which it does not release for some weeks.

Undoubtedly the most popular of all pouched animals is the **Koala** *(Phascolarctos cinereus)*, the living prototype of the teddy bear. This appealing little "Aussie" feeds only on the leaves of a dozen or so kinds of Eucalyptus, most of which are found here in the zoo grounds. In 1952 four specimens were received by the San Diego Zoo as a loan from the Australian government. They came from the Sydney Zoo through the courtesy of E. J. L. Hallstrom, president of the zoological society there. Later in 1952, they were presented as a permanent gift and goodwill gesture from the people of Australia to their friends in America. Exhibited in a full grown Eucalyptus tree, they are the only living Koalas outside of Australia.

From time to time various other types of Marsupials are exhibited in the zoo and may include the **Wombat** *(Phascolomys mitchelli)*, the **Brush-tailed Possum** *(Trichosurus vulpecula)*, the **Tasmanian Devil** *(Sarcophilus harrisii)* and the **Native "Cat"** *(Dasyurus quoll)*. Such animals as these will be found in the small mammal cages across from the camels.

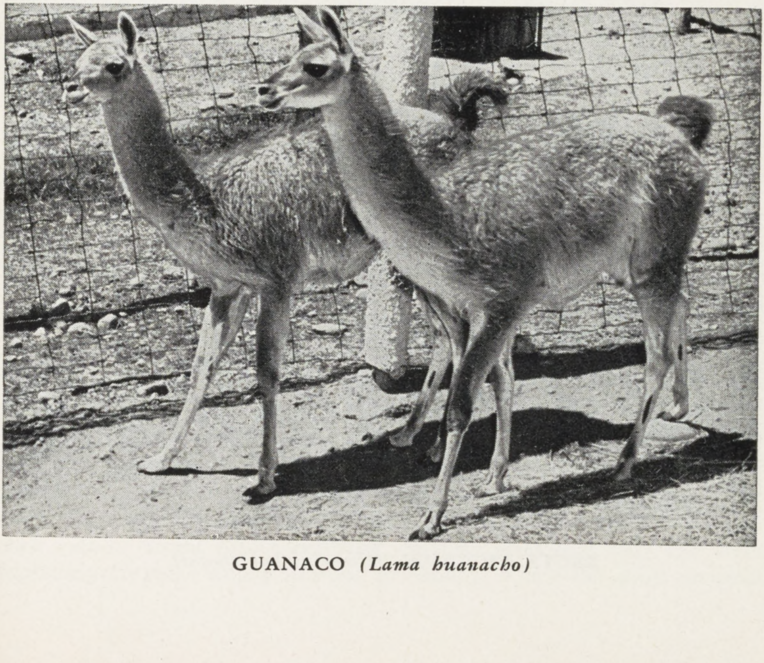
ANTEATERS, SLOTHS, AND ARMADILLOS

The **Giant Anteater** *(Myrmecophaga jubata)* of Central and South America is sometimes exhibited in one of the C-Mesa paddocks. Clothed in coarse black, gray and white fur, it has a flat brush of a tail with which it covers itself when lying down. Its elongate face terminates in a black snout, and its long viscous tongue is suited to a termite diet. The Giant Anteater uses its strong front claws to open termite nests. Here it eats ground meat, milk and eggs. Most other members of the Edentata or "Toothless Mammal" group make unsuitable exhibits either because of highly specialized diets or because they are burrowing or nocturnal animals. Species shown here have included: **Lesser Anteater** *(Tamandua tetradactyla)*, **Three-toed Sloth** *(Bradypus tridactylus)*, **Two-toed Sloth** *(Choloepus didactylus)*, **Six-banded Armadillo** *(Euphractus sexcinctus)*, **Hairy Armadillo** *(Chaetophractus villosus)*, all of Central or South America, and the **Nine-banded Armadillo** *(Dasypus novemcinctus)* of Texas.

CAMELS

Although long domesticated and used as beasts of burden, camels are an important item in every zoo collection. The single humped camel or **Dromedary** *(Camelus dromedarius)* of Africa and Arabia is used primarily as a riding animal and secondly as a pack animal while in the case of the two-humped or **Bactrian Camel** *(Camelus bactrianus)* just the reverse is true. Camels have been used throughout historic times to carry the products of the eastern countries across desert wastelands. They can exist upon the poorest of vegetation and go for long periods with little or no water. This is possible because of a series of sacs in the stomach walls of the camel which can store liquid until it is needed, at which time it is expelled by muscular contraction into the stomach. Wherever they have continued access to water, camels drink regularly. The domestic camel represents the wealth of its master and furnishes him milk, meat, and the wool for his rugs, blankets and clothing. The **Dromedary** is now known solely as a domestic beast but the **Bactrian Camel** is still found wild in certain areas of Chinese Turkestan and Mongolia.

In the New World the camel family is represented by four humpless species, two of which are still existent as wild forms and the other two only in a state of domestication. Best known of these is the **Llama** *(Lama glama)* which has been used as a pack animal in the Andes for centuries. The other domesticated form is the smaller **Alpaca** *(Lama pacos)* which is raised for its wool. Scientists tell us



GUANACO *(Lama huanacho)*

that both of these beasts were derived from the **Guanaco** *(Lama huanacho)*, a species which is native to the mountains from Peru to Tierra Fuego and ranges from sea level to an altitude of 15,000 feet. A fourth member of the llama clan is the **Vicunia** *(Vicugna vicugna)*, a gentle, almost deer-like creature which also inhabits the Andes.

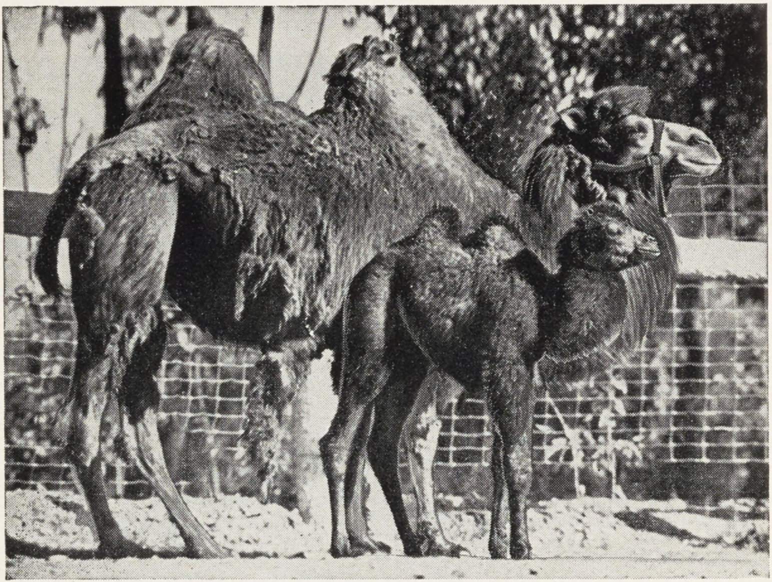
HYRAX

Exhibited in one of the arch cages directly across from the camels is a family group of East African **Rock Hyraxes** *(Procavia brucei)*, a species which despite its rodent-like appearance is actually the closest living relative to the elephant. Its toe-nails are distinctly hoof-like. As its name would indicate, the Rock Hyrax lives in rocky terrain where it inhabits burrows and crevices.

RODENTS

Most of the zoo's rodent specimens are to be found in a series of small cages and open pits on C Mesa, directly across from the camel stockades.

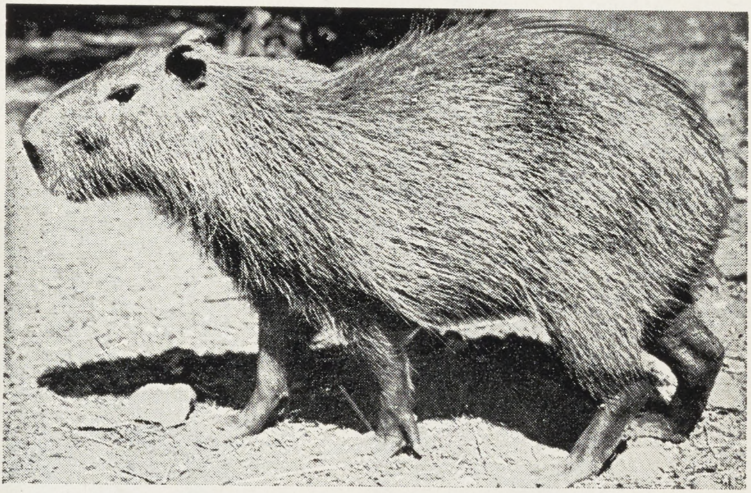
Usually to be seen here are specimens of **Prairie Dog** *(Cynomys ludovicianus)*. Native to the plains of central United States and



BACTRIAN CAMEL *(Camelus bactrianus)*

Mexico, they live in an extensive network of burrows which they have excavated themselves and make an attractive and interesting exhibit as they sit on the mounds which surround the burrow openings. Among other rodents that may be displayed here are the **Capybara** *(Hydrochoerus hydrochoerus)*, the largest of all rodents, and the **Paca** or **Painted "Rabbit"** *(Coelogenys paca)*, both of tropical America. Another of the large rodents usually on exhibit is the **Patagonian Cavy** or **Mara** *(Dolichotis patagonica)* which comes from the semi-arid regions of southern South America.

In the small arch-cages which surround these two enclosures are exhibited various other types of rodents which may include the **Crested Porcupine** *(Hystrix cristata)* of Africa, the **Hairy-Nosed Porcupine** *(Hystrix leucura)* of Asia, the **American Porcupine** *(Erethizon dorsatum)*, the commercial **Chinchilla** *(Chinchilla lanigera)*, and at least one species of the **Agoutis** *(Dasyprocta)*.

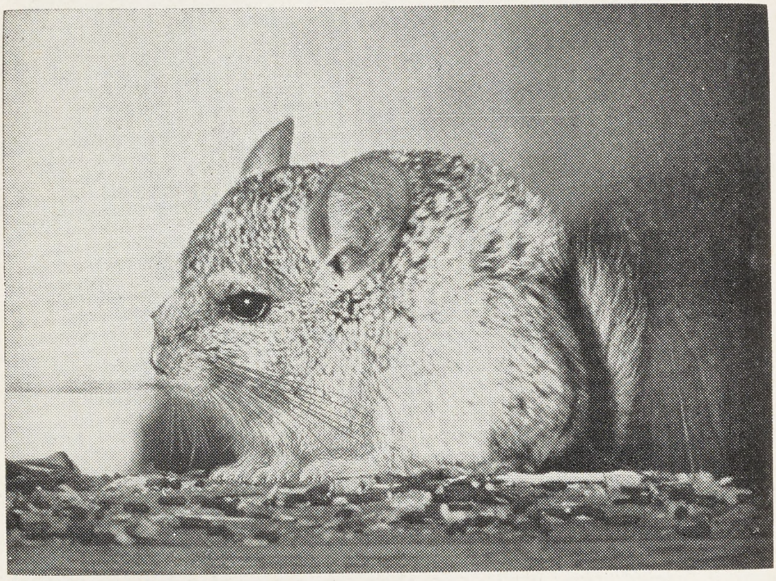


CAPYBARA *(Hydrochoerus hydrochoerus)*

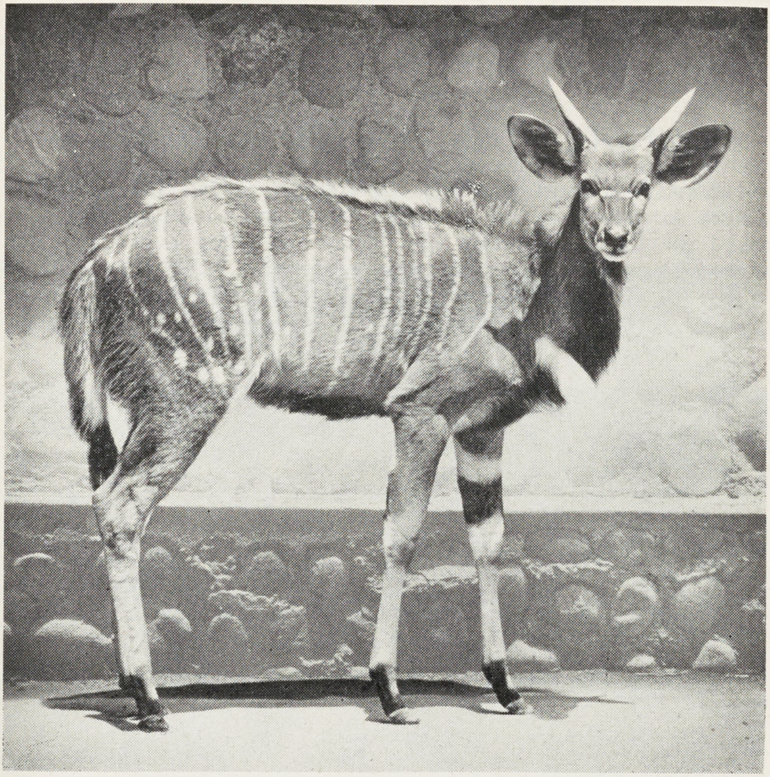
While we make little impression by such repetition, we feel that once again it would be advisable to assure our visitors that *porcupines cannot "shoot" their quills*, that their sole means of defense is to raise their suit of armor into a bristling, rattling mass that only the most foolhardy creature would attempt to handle. When the quills are held at such an angle, they are impossible for any creature touching the porcupine to avoid and, being loosely attached, they imbed themselves in the body, limbs or face of the antagonist and work themselves into the flesh.

Other rodents which may be seen in the collection are the **Beaver** *(Castor canadensis)* of North America, the **Coypu** or **Nutria** *(Myocastor coypus)* from southern South America and such members of the squirrel family as: **Woodchucks** *(Marmota monax)* and **Hoary Marmots** *(Marmota caligata)* of North America, the **Variable Squirrel** *(Sciurus variabilis)*, and the **White-bellied Red Tree Squirrel** *(Sciurus granatensis)* of the American tropics, the **Malabar Squirrel** *(Ratufa macrura maxima)*, and the **Giant Tree Squirrel** *(Ratufa bicolor)* of southeastern Asia.

Of all of the rodents in the zoo, however, the species that is most popular is none of these for occupying this position are the **Texas Fox Squirrels** *(Sciurus niger limitus)*, which having been released in Balboa Park some years ago, have established themselves as permanent residents and increase slightly with the passing of each year. They are friendly little creatures and will accept food from the hands of any visitor who is gentle and patient in his approach.



CHINCHILLA *(Chinchilla lanigera)*



YOUNG BUCK NYALA *(Tragelaphus angasii)*

Hoofed Animals

. . . "D" MESA . . .

UNGULATES: HOOFED ANIMALS

D-Mesa is situated at the extreme north end of the Zoological Garden farthest from the entrances. On it and on its slopes will be found the hoofed mammals (Ungulates) excepting a few that for various reasons are placed elsewhere.

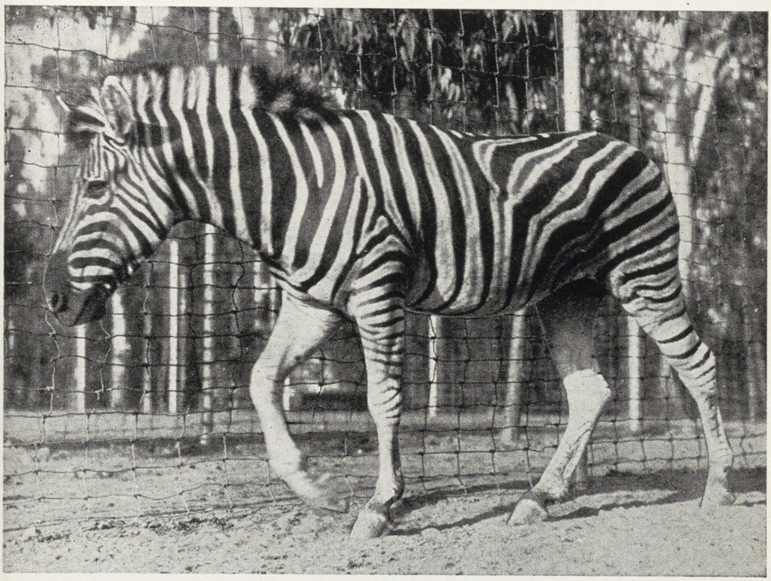
Here, as elsewhere in the zoo, the animals' natural habitat is simulated as nearly as possible. Animals coming from plains or rolling hill country are placed in large rectangular paddocks. At the rear of each paddock is a sturdy stone and concrete house into which the animals may retire. Within the enclosures of animals preferring mountain slopes or crags are placed high concrete pinnacles that the animals climb.

GRANT'S ZEBRA *(Hippotigris quagga bohmi)*

ZEBRAS

Zebras are classed with the wild horses and wild asses. Frequent attempts have been made to domesticate the zebra. In areas infested with the tsetse fly, zebras' natural immunity to its bite has made them desirable as work animals. As a group their unstable dispositions preclude any large scale attempts at domestication.

Size and striping are the most apparent factors in classifying zebras. However, within a species or even a sub-species, no two animals are striped identically. It may be said that the "hide-prints" of individuals vary to a fine degree.



CHAPMAN'S ZEBRA *(Hippotigris quagga chapmani)*

Three kinds of zebras have been shown in the collection. **Grevy's Zebra** *(Dolichohippus grevyi)* is the largest of all zebras. It is mule-like and has extremely narrow stripes. It is native to the deserts of northern Kenya and Ethiopia.

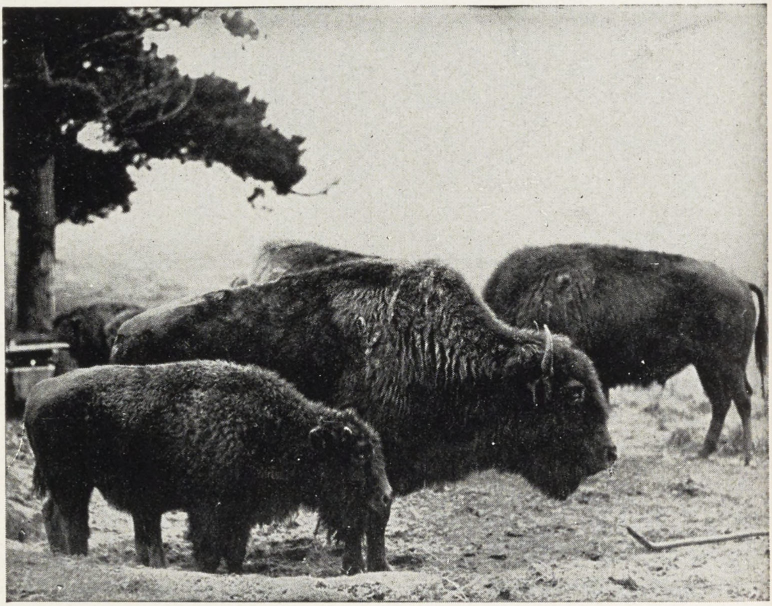
Grant's Zebra *(Hippotigris quagga bohmi)* is a smaller animal native to the highlands of British East Africa. It has broad black stripes and the white inter-spaces are usually clear.

Chapman's Zebra *(H. q. chapmani)* is a closely related form which inhabits south central Africa. Its broad stripes are separated on the flanks and hindquarters by brown "shadow stripes." The general background color is tan rather than white. Both of the last two forms belong to the group known as the Burchell Zebras.

WILD CATTLE

For centuries the **American Bison** or **American Buffalo** *(Bison bison)* had full run of one great grassland covering nearly all of the western United States and western Canada. In a comparatively short number of years, notably in the 1870's and 1880's, their millions were reduced by hide hunters to a handful of scattered bands not numbering altogether more than a few thousand animals. Protected government ranges are now set aside for them. The large, shaggy, distinctive looking beasts promise to be with us for many years. In fact their numbers are now increasing.

Tibet, land of eternal snows, chill winds, and plateaus at very high altitudes, is also the home of the **Yak** *(Poephagus grunniens)*. It has

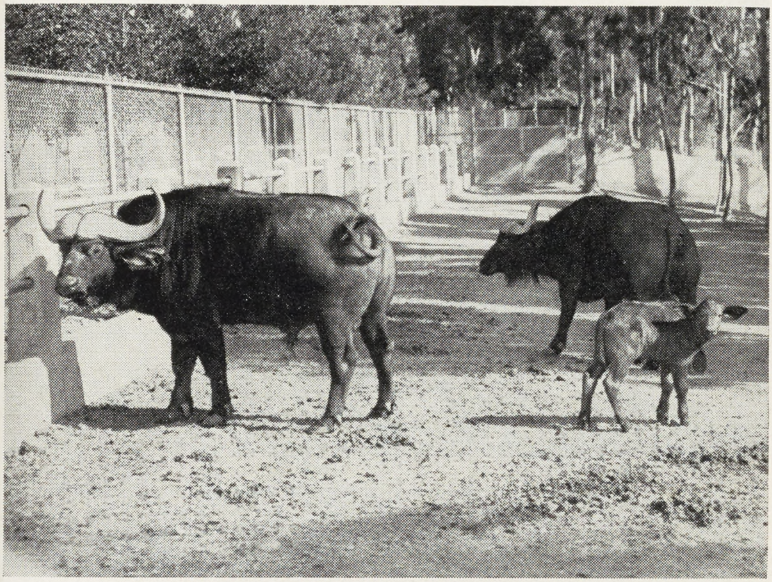


AMERICAN BISON *(Bison bison)*

been domesticated for a long period of time, but also remains as a wild animal. The hair and milk of the domestic Yak provide material for shelter and food for the Tibetans. The Yak is also the common carrier of burdens and is used as a riding animal. It may be said that the Yak is indispensable in the lives of the people who keep it.

Peculiar physically are the Yaks and American and European Bisons, in the respect that they possess fourteen pairs of ribs instead of the typical thirteen pairs of all other cattle.

The **African Buffalo** *(Syncerus caffer)* is considered to be one of the most formidable of African game animals. It roams in large herds and attacks human beings with little provocation. The **Indian** or **Water Buffalo** *(Bubalus bubalus)* of Asia, unlike its less tractable African cousin, has been widely domesticated.



AFRICAN BUFFALO *(Syncerus caffer)*

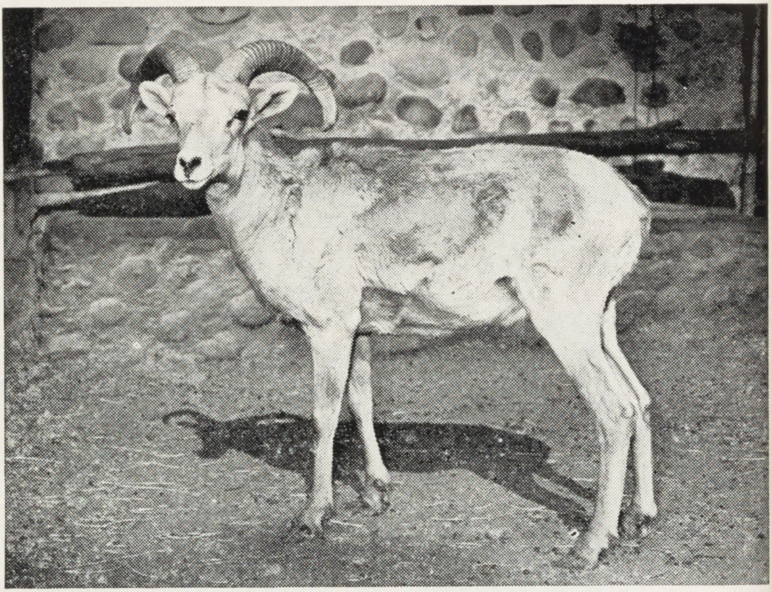
The **Anoa** *(Anoa depressicornis)*, pygmy of the wild cattle, is in appearance similar to the antelopes. It is, however, a true bovine and smallest of the oxen. The small size, straight horns, and light build, account for the near resemblance to the antelopes. It is native to Celebes.

Several young have been born here.

WILD SHEEP AND WILD GOATS

Bighorn Sheep *(Ovis canadensis)* range from the peninsula of Baja California northward to the Canadian Rockies. They are not necessarily confined to timbered, well watered, areas. The Nelson Bighorn, about two hundred of them, are found in the desert mountains of San Diego County.

There are several distinct types of Bighorn Sheep. The Dall Sheep, snow white in color, is found in the snow laden mountains of Alaska. The desert forms are generally lighter in color than the sheep of the Rockies.



NELSON'S BIGHORN *(Ovis canadensis nelsoni)*

On D-Mesa are found two kinds of Bighorn Sheep, *Ovis c. canadensis* from the Rockies and *Ovis canadensis nelsoni* from the deserts of California and Nevada.

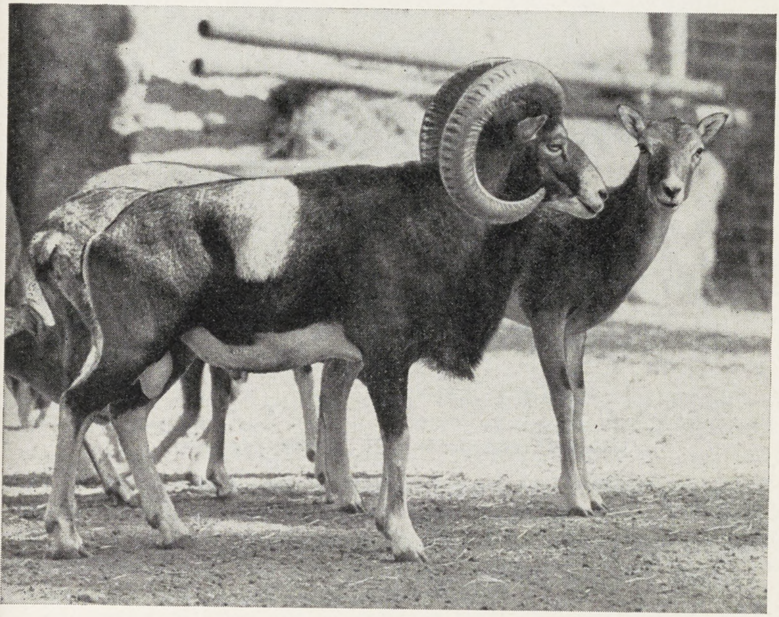
The **Mouflon Sheep** *(Ovis musimon)* is a comparatively small, but neatly formed, sheep confined to the islands of Corsica and Sardinia in the Mediterranean Sea.

There seems to be a close affinity between the Mouflon and domestic breeds of sheep. Wild Mouflons occasionally desert their kind to enter a domestic herd. In the reverse order, domestic lambs have been known to join a wild Mouflon herd. Scientists, for these and other reasons, say that the Mouflon is probably one of the wild sheep that have been the progenitors of all of our domestic breeds.

Of course, wild sheep are not wool bearers in the genuine sense of that term. The wool of domestic breeds is a result of selective breeding through long ages of domestication.

The **Barbary Sheep** *(Amnotragus lervia)* is commonly called **Aoudad,** although not known by that name in its native North Africa.

One of the many contrasts between wild sheep and wild goats is the fact that male sheep lack hairy adornment, such as chin whiskers. The Barbary Sheep is one exception to the rule; both rams and ewes have long fringes of hair hanging from below the chin over the chest and forelegs. In old rams this hair attains such lengths that the animals are referred to as the sheep with "chaps." The ewes of this species are unusual in that they bear horns nearly equal in size to those of rams.



MOUFLON SHEEP *(Ovis musimon)*

Confusing indeed, not only to the layman, but also to the scientist is the task of separating the wild goats from the wild sheep. Male goats generally have long horns, strong body odors, chin whiskers and are noted for the absence of glands below the eyes. All of the wild goats are confined to the "Old World," the so-called Rocky Mountain Goat being in fact a goat-like antelope peculiar to mountainous areas.

Although the **Tahr Goats** *(Hemitragus jemlahicus)* have unimpressive horns, they are certainly attractive animals. During the winter their long hair becomes longer still, forming a complete ruff around the neck.

The Tahrs frequent the rugged timbered crag-studded slopes of the Himalayas in northern India. In keeping with their liking for crags, they spend many of their morning hours climbing and jumping on the lofty concrete pinnacles constructed for them. Moreover, mothers occasionally give birth to kids on top of this structure. Kids quickly recover from the ordeal of being born. In an hour or two they are able to descend from their birthplace to the ground.

WHITE-BEARDED GNU *(Gorgon taurinus)*

Female Tahrs are unique among the sheep and goats in one respect. They have four teats in place of the characteristic two.

Ibex, differing only in size and minor physical characteristics, are found on three continents, Asia, Africa, and Europe. The **Arabian Ibex** *(Capra sinaitica)* is found from the Dead Sea south into the Sinai Peninsula and another closely related form inhabits North Africa. Ibex are true wild goats and in them we find the ancestors of our domestic varieties.

BLESBOK *(Damaliscus phillipsi)*

ANTELOPES

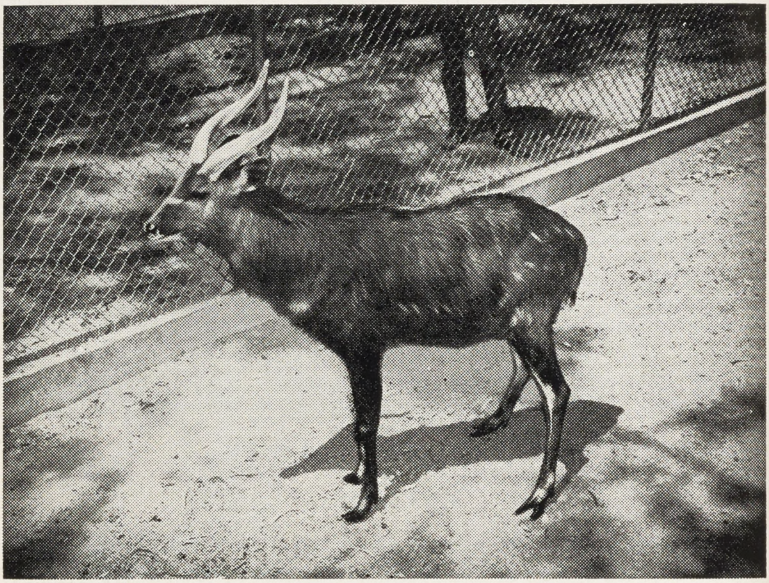
The **American Pronghorn** *(Antilocapra americana)* differs from typical antelopes in several respects. Foremost among these is the fact that it is the only horned animal that sheds a part of its horns periodically. It is placed in a family of its own. Typical antelopes are confined to Asia and Africa.

One of the most interesting of the antelope group is the **Wildebeest** or **White-bearded Gnu** *(Gorgon taurinus albojubatus)*. The Wildebeest roam the plains of Africa, mixing with the other hoofed animals. They are strong, compact, agile creatures, fleet of foot and having characteristics which would seem to link them to the horse, the buffalo and the antelope. This form inhabits British East Africa. The smaller and rarer **White-tailed Gnu** *(Connochaetes gnou)* of South Africa is now found only in a state of semi-domestication.

The **Blesbok** *(Damaliscus phillipsi)* was once the commonest of South African antelope. Now it is extinct in the wild and is found only on private farms and in game refuges. The Blesbok is related to the gnus and hartebeests.

Spectacular for its size and cow-like disposition is the **Eland** *(Taurotragus oryx)*, largest of all antelopes. It is native to eastern, central and southern Africa. Relatively gentle and a prolific breeder in captivity, it makes a first rate zoo exhibit.

The **Greater Kudu** *(Strepsiceros strepsiceros)* of central and South Africa is notable for the sweeping spiral horns of the male. While only the male grows the silky fringe of hair from its throat, both sexes are marked with vertical stripes of white.



SITATUNGA ***(Strepsiceros spekei)***

The **Sitatunga** *(Strepsiceros spekei)* is a little-known marsh-dwelling cousin of the Kudu. It inhabits equatorial and south-central Africa.

The **Nyala** *(Tragelaphus angasii)* of southeastern Africa is a handsome species in which the males have horns and shaggy grayish coats, and the females are hornless with short brown coats.

The **Nilgai** or **Blue Bull Antelope** *(Boselaphus tragocamelus)* of India is related to the four preceding species. The high withers give the animals an odd appearance and a stilted gait, while running. The common name is misleading. Bulls, it is true, are bluish in color, but cows and calves of both sexes are brownish. In proportion to its size, the bull has the smallest horns of all the antelopes.

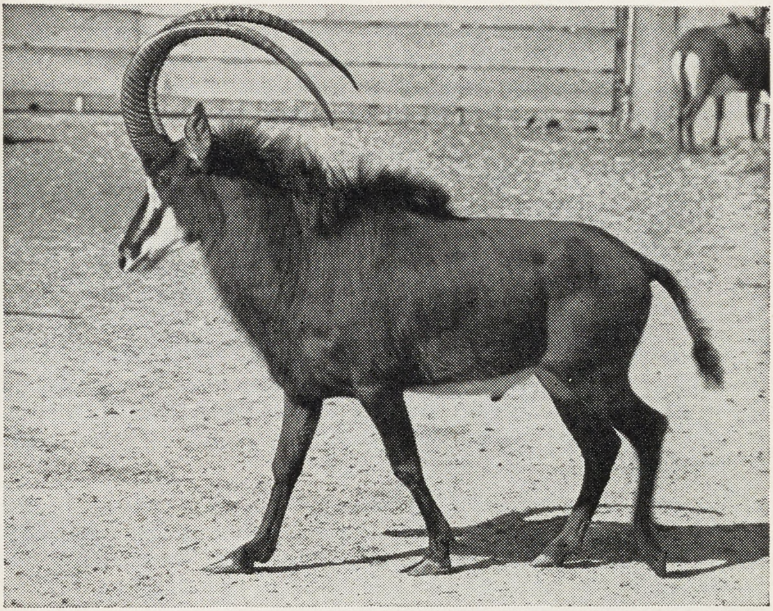
Waterbuck *(Kobus ellipsiprymnus)* are stocky, heavy-bodied antelopes found in rough country of Africa near water. The males often defend themselves by retreating into water neck deep, there to confront their attacker with a formidable barrier, the stout, curved horns.

Of all antelope the **Sable Antelope** *(Hippotragus niger)* of Africa is perhaps the most magnificent. The scimitar-shaped horns of the male are much prized by sportsmen and as a result this species has become less numerous in the wild and is not commonly seen in zoos.

The **Isabella Gazelle** *(Gazella isabella)* of North Africa is typical of the gazelles. These small antelopes are remarkable for their slender body form, pencil-like legs, small, often lyrate-shaped horns. These physical factors give them the grace in action and appearance that has made them universal favorites. **Bennett's Gazelle** *(G. bennetti)* is an Indian form which has been exhibited here.

The **Springbok** *(Antidorcas marsupialis)* is a South African member of the gazelle group. It is characterized by a patch of long, white and erectile hairs on the rump.

A distinctive feature of **Blackbuck** or **Sasin Antelope** *(Antilope cervicapra)* is the black and brownish mantle covering the buck's head, back and outer regions of the legs. Perhaps more striking are the long, spiralled horns, so twisted that they resemble corkscrews. These animals are so swift that on a hard surface greyhounds are unable to run them down. Cheetahs are occasionally employed to course them on their native plains of northern India.



SABLE ANTELOPE *(Hippotragus niger)*

Duikers, small antelopes of forest and bush, are found only in Africa. The **Black-backed Duiker** *(Cephalophus dorsalis)* is a red species that occurs from Sierra Leone south to Angola.

The **Rocky Mountain Goat** *(Oreamnos americanus)* of North America belongs to a group known as the "goat antelopes," which include the Chamois of Europe and the Takin of China. It is not a true goat. The species inhabits the mountains of northwestern United States, Canada and Alaska.

DEER

Deer are put in a family of their own primarily because the males or bucks have antlers instead of horns. A few species of the smaller deer have no antlers but agree in all other characteristics with the antlered deer; hence are classed with them.

Antlers, in adult specimens, are branched structures of true bone that are in most cases cast or shed annually. In their early stages of growth antlers are covered with skin and fuzzy hair. They are then said to be in the "velvet." All female deer are without antlers except the Caribou group, which includes the Reindeer.

The **Red Deer** *(Cervus elaphus)* and deer closely resembling it, including our own Wapiti or American Elk are found almost universally in the temperate zone north of the equator. All nearly related species are reddish in color. Bucks are noted for their huge antlers.

Red Deer formerly ranged throughout all of western Europe in favorable country. On the continent very limited numbers are now found. Since Medieval times deer have been protected on private hunting grounds set aside by royal decree for the peerage in England and Scotland. Large herds are consequently found today in Britain, especially in the Highlands of Scotland. Red Deer are native also to North Africa and Asia.

The **Barasingha** or **Twelve-tined Deer** *(Cervus duvauceli)* is the only Indian deer whose antlers have more than three tines or points. Barasingha is the native name meaning Twelve-tined Deer. These large, yellowish, comparatively long-haired deer are found on grassy plains or open areas near forests in northern India.

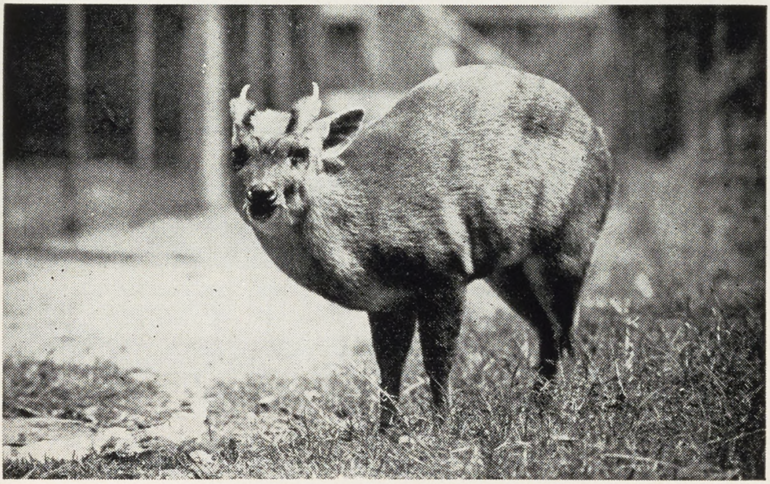
The dark brownish color and heavy, but short, antlers of the **Sambar Deer** *(Cervus unicolor)* tend to set it apart from other members of the family. Notable too, is the long brushy tail which has earned for its bearer the common name in the Occident, "Horse-tailed Deer." It prefers the deep shaded forests of much of southeastern Asia. Our specimens belong to the Malayan form *(equinus)*.

The **Japanese Deer** *(Cervus nippon)* and allied species are found on the islands of Japan and the mainland coastal strip opposing the Japanese Archipelago. Adults of the Sika Deer are spotted during the summer season. Parks in Japan abound with the Sika.

Many deer are spotted when fawns. Most of them, however, lose their spots as they approach maturity. The **Axis Deer** *(Axis maculatus)*, however, keeps its spots throughout life. The white spots and graceful form of its antlers and body make it one of the most attractive animals among the deer. For some reason, perhaps it may be attributed to the likeness of the Axis on Christmas cards, children delight in calling them Santa Claus' Deer. The Axis is native to India, and the closely related **Hog Deer** *(A. porcinus)* occurs as well in Burma and Assam.

The small **Muntjac** *(Muntiacus reevesi)* of China is also known as the Rib-faced or Barking Deer. Being very inferiorly equipped with antlers, the Muntjac has a pair of long canine teeth protruding from the upper jaw. With these as well as the antlers they defend themselves. The antlers are unusually formed, being mounted on hair-covered pedicles protruding from the skull for about three inches, nearly as long as the antlers. When excited the Muntjac issues a loud single bark like that of a dog. The **Indian Muntjac** *(M. muntjac)* has also been exhibited here.

Far removed from their original home, the Mediterranean, are found the small palmate-antlered deer known as **Fallow Deer** *(Dama dama)*. They were probably introduced to northern Europe by the Romans. Herds have become so extensive that they are now the common park



CHINESE MUNTJAC *(Muntiacus reevesi)*

deer of Britain. The Fallow Deer vary in color, some being white, others range through shades from tan to a very dark brown.

NORTH AMERICAN DEER

The largest members of the deer family belong to the Moose clan. The **American Moose** *(Alces americana)* is typical of its group, being characterized by its large size and the spreading, palmate antlers of the male. It and allied species inhabit much of the wooded country in the colder regions of the Northern Hemisphere.

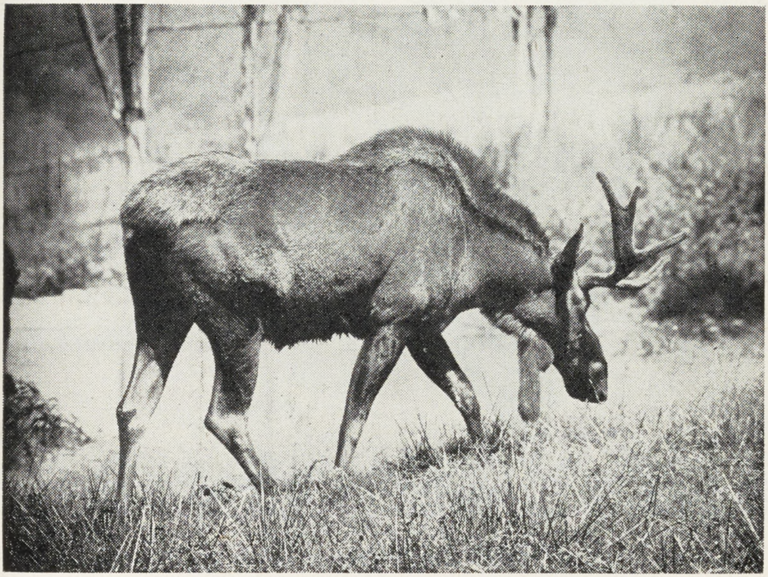
The **Wapiti** or **American Elk** *(Cervus canadensis)* is the second largest member of the deer tribe. Formerly, Elk ranged throughout favored areas in the United States and Canada. They are now restricted to areas in the west. Well known is the large herd in the Yellowstone Park area. Large numbers of Elk also remain in the Olympic Peninsula of Washington. Smallest of the Elk are the Tule Elk. One small herd of these animals remains in Kern County, California.

WAPITI OR AMERICAN ELK *(Cervus canadensis)*

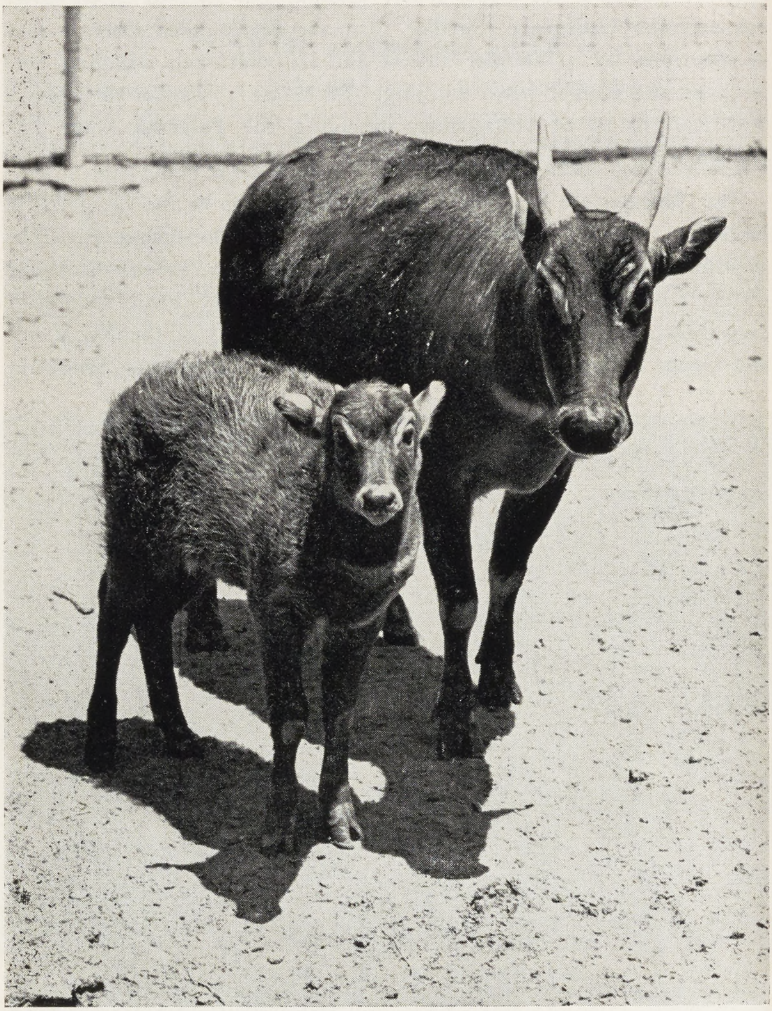
The **Black-tailed Deer** *(Odocoileus hemionus columbianus)* of the Pacific Coast and the **Mule Deer** *(O. h. fuliginatus)* of Southern California, are closely related and very similar in appearance. They are to be distinguished by the all-black tail of the Black-tail and the partly white tail of the Mule Deer.

The **White-Tailed Deer** *(Odocoileus virginianus)* includes the Atlantic seaboard, the Great Plains, Oregon and Arizona in its range but excludes California. Smaller than the Black-tailed Deer it may be identified by its simpler antlers and its white tail which is held erect by the animal when running. There are a number of tropical American forms of this group, including the **Panama Deer** *(O. chiriquensis)* of Central America.

The Caribous are large, dense coated deer native to the far north in both the eastern and western hemispheres. They are characterized by snowshoe-like hoofs and the fact that both sexes bear antlers. Although members of this group do not do well in captivity, two forms have been shown here: the **Reindeer** *(Rangifer rangifer)* of the Old World and **Grant's Caribou** *(R. arcticus granti)* of the Alaskan Peninsula.



AMERICAN MOOSE *(Alces americana)*



ANOA *(Anoa depressicornis)*

MANED WOLF *(Chrysocyon jubatus)*

Carnivorous Animals

. . . "F" CANYON . . .

Small Cage Animals

. . . "G" CANYON . . .

CARNIVORES

BEARS

Bears may readily be distinguished from some of the other carnivores. They are plantigrade (walk solidly upon the soles of the feet instead of upon the toes as, for example, the cats and foxes). Five claws on both the fore and hind feet are distinctive features.

Bears are widely distributed and may be found in portions of five continents. They are great favorites in the zoo, being persistent clowns and amusing the public with their every-day antics.

The **Black Bear** *(Euarctos americanus)* is distributed throughout the entire area of United States and Canada, down into Mexico. Two distinctive color phases are known in addition to a host of geographic races.

Black bears seldom exceed five hundred pounds in weight. Their coloration is variable, being brown and black. The color is solid, with the exception of light brown or ashy gray on the muzzle and sometimes a white crescent on the chest. The cinnamon color phase is common in our mountains of the west and northwest. This is the only bear native to North America that climbs trees.

The **Grizzly Bear** *(Ursus horribilis)*, too, is a form of brown bear peculiar to North America. Many subspecies have been described, occupying an area from southern Durango, Mexico, northward to the Rocky Mountains and to the Arctic Coast of Alaska. The California Grizzly was the largest of his race, but now they appear to be extinct.

The coloration of these animals varies from a light-buff to near black. More often the hairs of the sides of the body, the neck and shoulders are tipped with a yellowish color giving a frosty appearance which suggests the common name grizzly or silver tip.

The prominent withers and the long proportionately slender and slightly curved claws on the fore-feet will serve to distinguish the species from other brown bears.

A representative of the giant bears of Alaska is the **Kodiak Bear** *(Ursus middendorffi)* from Kodiak Island and adjacent territories. This species and its allies are not only the largest bears known but also have the honor of being the world's largest land carnivora. The maximum weight of the Kodiak will exceed eighteen hundred pounds. These colossal beasts have a pelage varying from a dull golden yellow to a dusky brown or almost black.

MONTAGUE ISLAND GIANT GRIZZLY *(Ursus sheldoni)*

The **Montague Island Giant Grizzly** *(Ursus sheldoni)* is a closely related but somewhat smaller form which inhabits Montague Island in Prince William Sound, Alaska.

The **Polar Bear** *(Thalarctos maritimus)*, easily distinguished by its invariably white or creamy color, inhabits the bleak arctic regions of both the western and eastern world. They live upon seal largely, but prowl in search of food through snow fields and glaciers. The species occurs in the Arctic regions of both the New and Old Worlds.

From the Andes Mountains of Colombia and Peru, comes a quaint little animal, the only bear native to South America. The **Spectacled Bear** *(Tremarctos ornatus)* is so called from the tawny circles around the eyes, showing in strong contrast to its black coat. Adults measure about three and one-half feet in length and weigh about one hundred and fifty pounds. These bears, among the rarest animals seen in captivity, were presented to the zoo by the Allan Hancock Foundation.

The **European Brown Bear** *(Ursus arctos)* is a large and intelligent animal. Its color is a mixture of gray and brown. As a wild bear it is found in the unsettled regions of Russia, Scandinavia and Germany.

From Europe its range extends to North Africa. Through many parts of Asia other forms of the Brown Bear occur. It is the bear used for training.

The **Himalayan Bear** *(Selenarctos tibetanus)* is but one of the several species of Black Bears native to Asia and neighboring islands. It is rather common in Central Asia, extending its habitat from portions of China to India. A near relative exists in Japan. This species has a comparatively black coat with an ever present broad white chevron on the chest. Sometimes the lower lip is white. The ears are relatively large and covered with rather long hair. Having a face not unlike

SPECTACLED BEAR ***(Tremarctos ornatus)***

that of a shepherd dog, the Himalayan bear, if trained young, is capable of becoming a splendid performer until adult.

The **Sun Bear** *(Helarctos malayanus)* is the smallest of the Asiatic bears, having an extended range through the tropics of India, Burma, Malay, Java, Borneo and Sumatra. Aside from the gray or brown on the muzzle and the white or orange chevron on the breast, the coat of this little bear is jet black and the hair is short and smooth. The claws are strong and greatly curved, the jaws and teeth are powerfully constructed, resembling those of the extinct cave bear, terror of the Stone Age. These bears are fierce, mean and destructive.

The **Sloth Bear** *(Melursus ursinus)* from the far east is unique among its kindred. Being strongly nocturnal, it is seldom encountered by travelers. Adult males may attain a weight of nearly three hundred pounds. The greatly curved claws are well developed in this race. Usually it bears a white chevron on the breast. The coat is of long, coarse black hair which reaches its greatest length upon the shoulders. The ears also are fringed with long hairs. The gray muzzle is greatly elongated and very mobile. Sloth bears have great power of suction, drawing their food by strong inhalations into their mouths. Thus endowed by nature, it indulges its fondness for ants and their larvæ easily and from considerable distance.

Specimens of several species of bear have been born and reared here, among them: Polar, American Black, Grizzly, Malayan Sun and European Brown bears.

SEA MAMMALS

This group includes the marine carnivora. Representatives are the seals and walruses. Since the limbs have been modified into paddle-like organs, the animals are adapted for an aquatic existence in the ocean. The teeth are simple in structure. Their food consists chiefly of fish, crustaceans and mollusks.

These are strongly gregarious and polygamous. In certain seasons they seek their island breeding grounds in vast numbers. Males far exceed the females in size. Seals are world wide in distribution. Seals and whales have been subjected to remorseless pursuit by mankind.

WALRUSES

Walruses are characterized by their large size, thick bodies, coarse whiskers, and well developed tusks. They inhabit the seas of the far north. There are two forms, both of which, the **Pacific Walrus** *(Odobenus divergens)* and the **Atlantic Walrus** *(O. rosmarus)* have been shown here.

An adult male walrus of either species may reach a length of eleven feet and a weight of 3000 pounds. Mature females are considerably smaller.

EARED SEALS

Members of this family are characterized by the presence of an external ear that is easily detected at close range. Furthermore, the hind flippers, extended, are used as a rudder when swimming or, reversed, are used for walking upon the shore.

The **Patagonian (Snub-nosed) Sealion** *(Otaria flavescens)* frequents the coastal waters from Chile and Peru to the Galapagos and the Falkland Islands. The adult males, which often attain enormous

NORTHERN FUR SEAL *(Callorhinus alascans)* dimensions, are of a rich brown color; the females are somewhat grayer. Though not always distinctly seen, there is a growth of long hairs that forms a mane on the necks of the males. The muzzle is thick and truncated and the animals utter a deep hoarse growl that is audible for a great distance.

The **Steller Sealion** *(Eumetopias jubata)* is the larger of the eared seals of the coast of California. The males are more than twice the size of the females, attaining a length of from eleven to thirteen feet and a weight of from one thousand to fifteen hundred pounds. Like other sealions, this species is entirely migratory, drifting southward in winter to the warmer waters on each side of the Pacific. In Spring, the Steller Sealion moves on its northern journey as far north along the coast as the Aleutian Islands and the mainland of Alaska.

The **California Sealion** *(Zalophus californianus)* is distinguishable from the Steller Sealion by its generally smaller size and by its clear barking call that can, under favorable conditions, be heard for a distance of miles. In the wild state these animals occur along the Pacific Coast from Lower California to Santa Barbara. Adult males often attain a length of from six to eight feet. This is the trained seal common to the zoo and circus. While in the zoo in F-Canyon these animals enjoy their large pool, where they dart in and out with admirable skill. Their yapping is an incessant din.

The **Northern Fur Seal** *(Callorhinus ursinus)* is migratory, spending its winters roaming through the Pacific south to San Diego, returning to the Pribilof Islands in enormous herds during breeding season. This is the only point at which it touches land.

The color of the males is a blackish brown with light tips on the outer hairs. The under fur, which is very abundant, is buffy brown. Females and the young tend to be more gray. Adult males are generally four or five times larger than the opposite sex, weighing from six to eight hundred pounds. The fur seals are highly polygamous. Vigorous males secure a harem as large as they can defend against rivals and the members may number one hundred cows, all under strict discipline.

The zoo's specimens were placed on exhibit here by the U. S. Fish & Wildlife Service with the exception of a male that was born in the zoo in 1948. It is the first of its kind to be born and reared in captivity.

The **Philippi's Fur Seal** *(Arctocephalus philippii)* of South America and the **Guadalupe Fur Seal** *(Arctocephalus townsendi)* of Guadalupe Island, Mexico, have also been shown here.

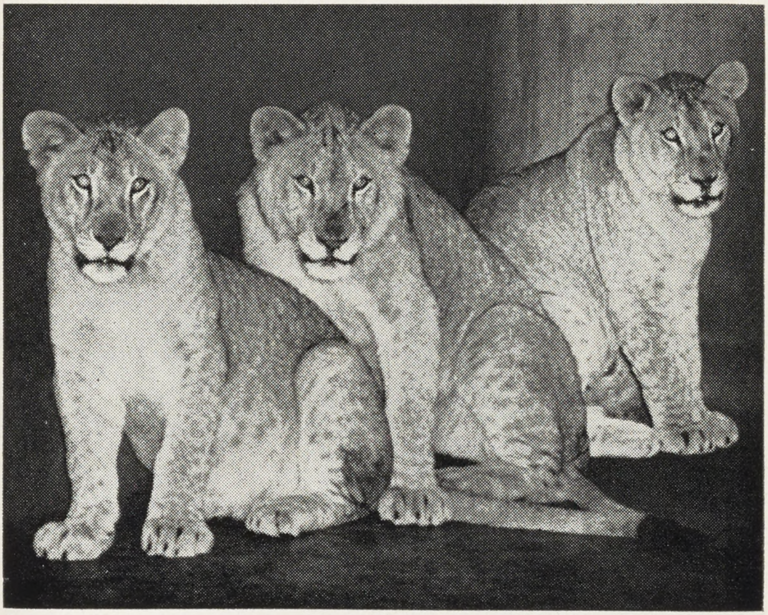
EARLESS SEALS

The **Leopard** or **Harbor Seal** *(Phoca vitulina)* and its allies are distinct from the eared seals not only in that they have no external ears, but because their flippers are incapable of reversion for use on land. They do furnish an effective rudder for swimming, but harbor seals are most awkward on shore. These widely distributed seals occur on the Pacific Coast from Lower California to Alaska and from Northeastern Canada on the Atlantic to South Carolina. They are rather common along some of the coastal areas of Europe.

The sexes are generally of equal size, attaining a length of from five to six feet. The young have yellowish white coats at birth but quickly acquire the color of the parents, which is a mottled suffusion of greenish black on a yellowish gray ground. Since the Leopard Seal is non-migratory it is likely to be a permanent resident wherever met. Although not living in pairs, it is neither gregarious nor polygamous.

The **Hawaiian Monk Seal** *(Monachus schauinslandi)* inhabits the leeward islands in the Hawaiian chain. The species is rare in the wild state due to commercial sealing during the 19th century. A specimen obtained by the San Diego Zoo from the Honolulu Zoo in 1951 was the first to enter the United States alive.

The **Northern Elephant Seal** (*Mirounga angustirostris*) is the giant among the seal group and there is no other creature with which it can be confused. The name elephant seal has derived from the size and the long flexible nose confined to the males of the species. According to the will of the owner, the proboscis can be inflated or distended and when fully relaxed it may be from seven to eight inches in length, suggesting the likeness to that of an elephant's trunk. These picturesque denizens of the misty sea have unfortunately been exterminated over most of their former range until the last herd of the Northern Elephant Seal is restricted to the Guadalupe Island off Lower California. Recently a few have been found in old haunts, especially San Benitos. The males not uncommonly grow to a length of over twenty feet and exceed two tons in weight, whereas the females are much smaller.



MASAI LION *(Felis leo massaica)*

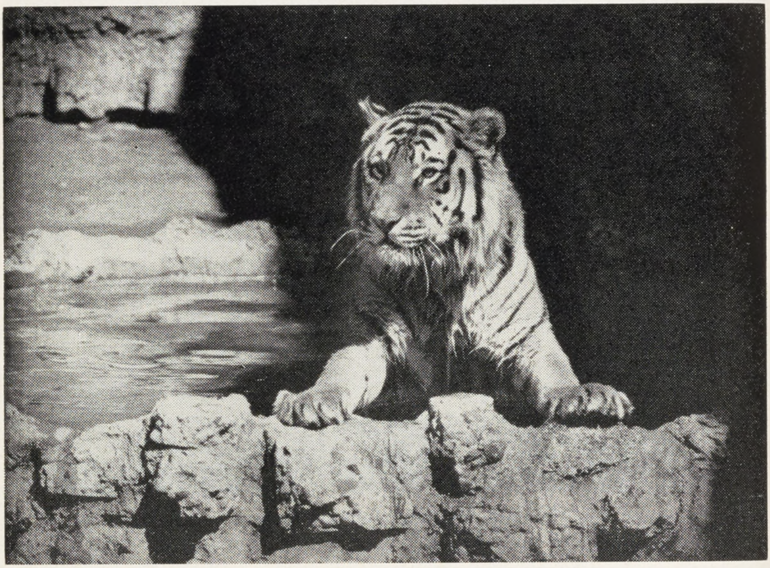
CATS

This is an impressive family of carnivores occurring in North and South America, Europe, Asia, and Africa. Distinctive features of its members are the short and rounded skulls and the ability to contract the pupils of the eyes. Moreover, the feet are digitigrade, while the toes number five on each fore-foot and four on each hind one. The claws, sharp and curved, are retractile, moving in and out of horny sheaths. The softly padded feet carry the cat in dead silence.

Both structurally and in habits, the cats are all very similar. All are destroyers of living flesh and among the larger ones are found the most fierce and dreadful beasts of prey, often proving more than a match for man and his modern firearms. Stealth, surprise, and sudden overwhelming fury of attack are the tactics characteristic of the species.

These two open grottoes for lions and tigers are among the first to be built for these cats.

The **Lion** *(Felis leo)* has long been the emblem of strength and of greatness. Upon his brow nature has placed her stamp of royalty. The lion, once widely distributed, is now almost entirely confined to Africa and to small areas in Persia and India.



TIGER *(Felis tigris)*

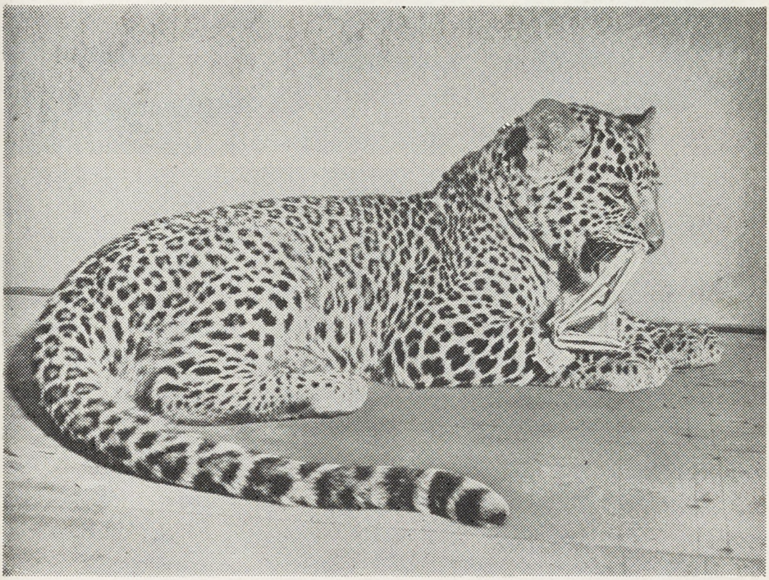
From tip of nose to tip of tail adult males may have a length of from nine to eleven feet and four hundred pounds is the average weight, increasing in some specimens to six hundred pounds.

It is the male only that is graced with a mane, and large manes are not seen often in the wild.

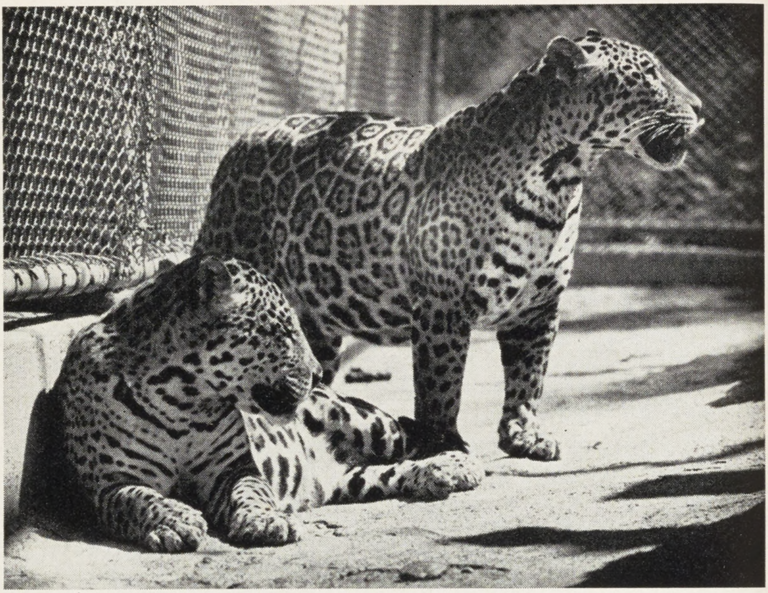
The **Tiger** *(Felis tigris)* is native to Asia and certain of the East Indies. It is represented by several local races and it is found not only in tropical forests but in the cold wastes of Manchuria and Siberia as well. Tigers hunt chiefly at night and prey upon deer, antelope, and wild swine. Occasionally an individual Tiger turns man-eater, but this is almost invariably due to injury, old age, or some other handicap which renders the hunting of livelier and more palatable game impossible. Tigers, like many species of cats, are fond of bathing and in the wild are seldom found far from ponds or rivers. In captivity they are often observed almost entirely submerged in their pools.

North of C-Mesa, the entrance to G-Canyon is at the east end of D-Mesa. G-Canyon is known to San Diego Zoo frequenters as the "Hog, Dog, and Cat Canyon" and, as the name would suggest, here may be found several of the larger cats and many small ones, also a group of small carnivores, wild dogs and swine. G-Canyon at the lower end converges with F-Canyon just below the tiger grotto and at the upper end terminates in the main road connecting C- and D-Mesas.

Turning north and east below the Tiger Grottoes located in the lower end of G-Canyon, you will see upon your right five large cages which house others of the big cats. While larger and heavier species like the lion and tiger may be exhibited safely in moated enclosures, those felines capable of jumping great distances must be displayed in safely enclosed cages. With little trouble they could leap across the moats and over walls which prove such successful barriers to their more weighty and less agile cousins. Each cage has been constructed



PERSIAN LEOPARD *(Felis pardus pantherus)*



JAGUAR *(Felis onca)*

on the hill-slope and its cement floor has been terraced, allowing for excellent drainage. In the center of each enclosure a great concrete tree has been erected, and sprawling astride its branches the cats spend many daylight hours basking in the sunlight. In the rear are large sleeping quarters divided into several compartments so that animals may be separated when fed and held in confinement when necessary.

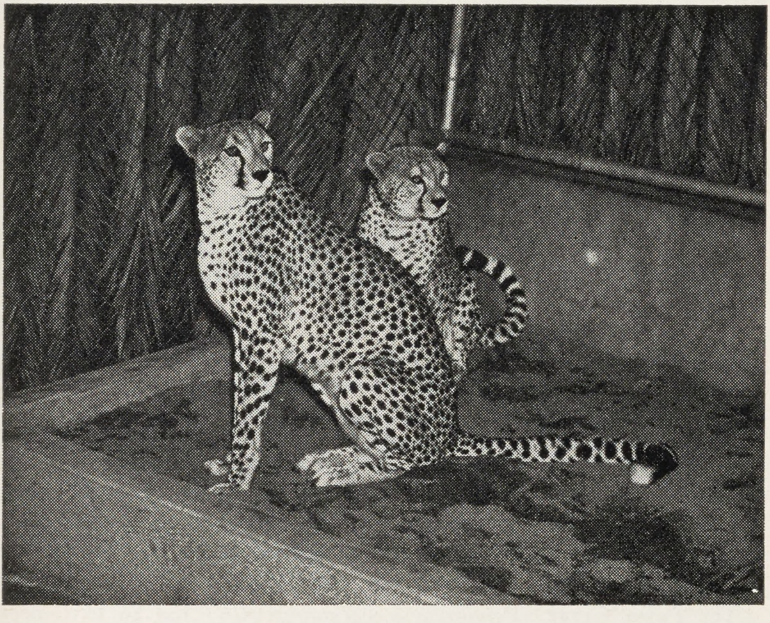
Among the fiercest of the big cats are the **Leopards** *(Felis pardus)* of Asia and Africa. Most commonly seen both in the wild and in zoological collections is the **Spotted Leopard** but in addition to this form there is a melanistic phase known as the **Black Leopard** or **Panther.** Although each of the phases usually breeds true and produces young which are the same color as their parents, there may be both spotted and black cubs in the same litter.

The magnificent and rare **Snow Leopard** *(Felis uncia)* inhabits the Himalayas and, because of its long, dense coat, can endure extreme cold. It is seldom exhibited in zoos.

The **Jaguar** *(Felis onca)* of Mexico, Central and South America is similar in appearance to the spotted leopard but in reality is a much more heavy-bodied animal. Once found wild in California, it is now extinct in most parts of this country with the exception of the country bordering central Mexico. The Jaguar is the largest cat of the western hemisphere.

The **Mountain Lion** *(Felis concolor)*, known by such names as Cougar, Catamount, Puma, Panther and Painter, ranges from southern South America to the colder regions of North America. It is by far the largest cat found wild in California and has been much hunted because of its attacks on livestock and deer.

The **Cheetah** or **Hunting Leopard** *(Acinonyx jubatus)* from Africa and India is considered the fleetest of foot of all mammals. In fact, it has been clocked at running over seventy miles per hour. It has an extremely gentle disposition and can usually be treated as a pet. In India it has been trained to hunt the Sasin or Blackbuck Antelope.



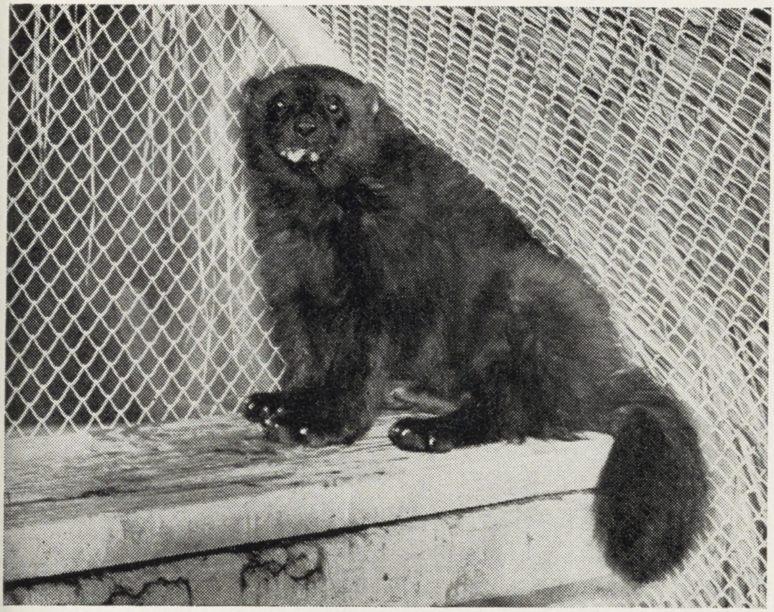
CHEETAH OR HUNTING LEOPARD *(Acinonyx jubatus)*

MISCELLANEOUS GROUPS

On the west side of G-Canyon, a series of twenty arch cages houses the collection of small carnivores and from time to time various other creatures for which the cages seem suited. Of the small meat-eating mammals, the cats have perhaps the most general appeal, and of these a number of interesting and strikingly marked species are usually to be found. The beautiful **Clouded Cat** *(Felis nebulosa)* of southeastern Asia and certain of the East Indies is rare in collections. From the southeastern Himalayas comes the **Golden Cat** *(Felis temmincki)* and from Siam comes the **Jungle Cat** *(Felis chaus)*. The **Serval** *(Felis serval)* ranges through central and southern Africa. Representing the New World tropics are the lovely **Ocelot** *(Felis pardalis)* and the **Jaguarundi** *(Felis cacomitli)*, both of which include southern Texas in their distribution. The **Canadian Lynx** *(Lynx canadensis)*, which is found in Canada and northern United States, and the smaller **Bob Cat** or **Bay Lynx** *(Lynx rufus)* of the United States, and Mexico are characterized by their "bob-tails" and tufted ears.

OCELOT *(Felis pardalis)*

The **Palm Civet** *(Paradoxurus hermaphroditis)* has an extremely extensive range, being found from China south throughout southeast-



WOLVERINE *(Gulo luscus)*

ern Asia to Sumatra, Ceram and the Philippines. The **Lesser Indian Civet** *(Viverra zibethica)* is the species from which the civet scent of commerce is obtained. The **Binturong** *(Arctitis binturong)* of southeastern Asia and the East Indies is a large, arboreal civet with a prehensile tail.

The Mustelids occupy the same position in New World fauna that the Civets do in the Old World. Best known of these is probably the **American Badger** *(Taxidea taxus)* of temperate North America. The **Fisher** *(Martes pennanti)* and the **Marten** *(Martes americana)*, both of North America, are noted for their luxuriant coats. The **Tayra** *(Tayra barbara)* is related to the marten and the weasel and inhabits tropical America. The **Wolverine** *(Gulo luscus)*, of which our specimens came from the Kenai Peninsula, Alaska, is the largest member of the family. The **Hog Badger** *(Arctonyx collaris)* is native to southeastern Asia.

Of the raccoon family, several species are usually to be found in the zoo: The **North American Raccoon** *(Procyon lotor)* and its tropical cousin the **Crab-Eating Raccoon** *(Procyon cancrivorus)*, and the **Coatimundis** *(Nasua narica)*, and *(N. nasua)* also of tropical America. While superficially dissimilar to the typical raccoon, the long-nosed "coati" is closely related. The **Kinkajou** *(Potos flavus)* and the **Cacomistle** *(Bassariscus astutus)*, of the same family, are not usually shown here because they are nocturnal.

Representing the raccoon family in the Eastern Hemisphere are the much publicized pandas. While quite different in build and coloration, the two species, the **Giant Panda** *(Ailuropoda melanoleuca)* and the **Lesser Panda** *(Ailurus fulgens)* are closely related; both inhabit the high mountains of central-eastern Asia and both are rare in collections. The name Panda is a contraction of two Nepalese words which mean bamboo-eater for these animals are vegetarians and in the wild this plant is their chief source of food.

The **Lesser Panda,** the species exhibited here, is a native of the eastern Himalayas. An attractive little animal, it is quite delicate and as a general rule does not do well in captivity. We have been extremely fortunate in regular annual increase of our panda exhibit by birth. The breeding and rearing of captive pandas is of rare occurrence.

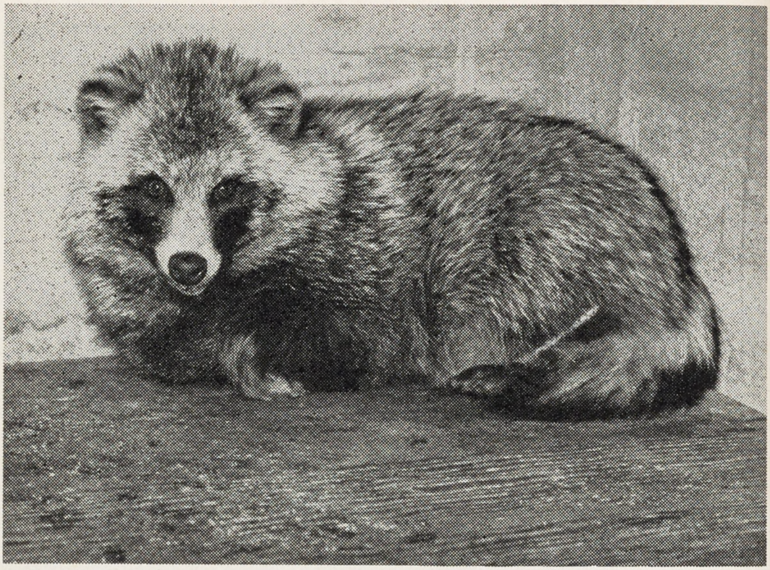
Among the small dogs usually on exhibit are the **Red** and **Silver Foxes** which are merely color phases of the same species, *(Vulpes fulva)*. Despite the nervous temperament of foxes, specimens of both of these have been bred, born, and raised in the zoo. The species is found throughout most of the United States and Canada. The **California Gray Fox** is a typical member of its species *(Urocyon cinereoargenteus)* and several of the specimens exhibited here were trapped

FISHER *(Martes pennanti)*

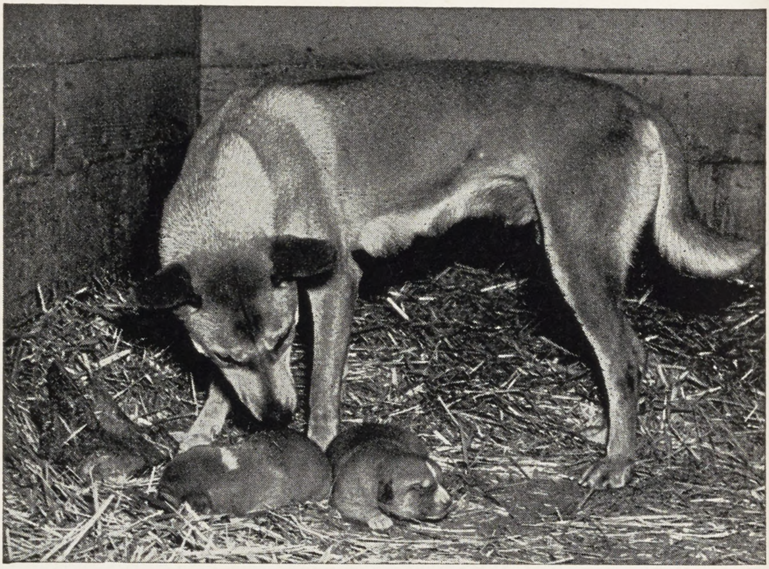
LESSER PANDA *(Ailurus fulgens)*

in the zoo grounds because they preyed regularly on the peafowl. Found only on the island of San Clemente which lies off the coast of Southern California, the **San Clemente Fox** *(Urocyon clementae)* is a species of gray fox which is seldom exhibited. Representing this group in the American tropics is the **Crab-Eating Fox** *(Urocyon guatemalæ)* of Central America. Like the Red Fox, the **Arctic Fox** *(Alopex lagopus)* has more than one color phase, having both blue and white forms, both of which are on exhibit here. A denizen of southwestern United States is the diminutive **Long-Eared Fox** *(Vulpes macrotis)*, also known as Swift and Kit Fox. The North African **Fennec Fox** *(Fennecus zerda)* like the Swift is a small, sand-colored desert fox noted for its large ears. The **Raccoon Dog** *(Nyctereutes procynoides)* is a fox-like creature native to Japan and eastern Asia. The **Culpeo** *(Dusicyon culpaeus)*, native to western South America, is a larger form which also resembles a fox. The **Maned Wolf** *(Chrysocyon jubatus)* is a rare species which inhabits Brazil, Paraguay and Uruguay.

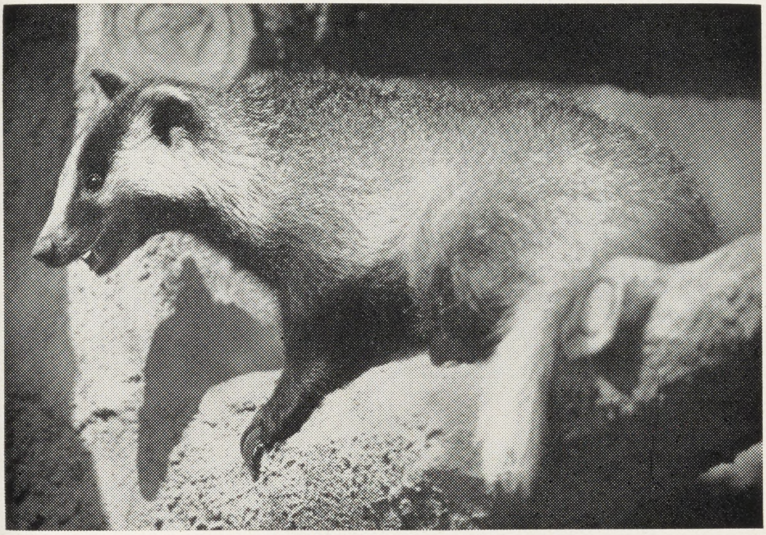
The **Dingo** *(Canis dingo)* or **Warrigal,** a wild dog of Australia, is believed to have been imported to Australia thousands of years ago by primitive man. The Dingo roams in packs and causes much damage in its ruthless slaughter of livestock. The **Canadian Timber Wolf**



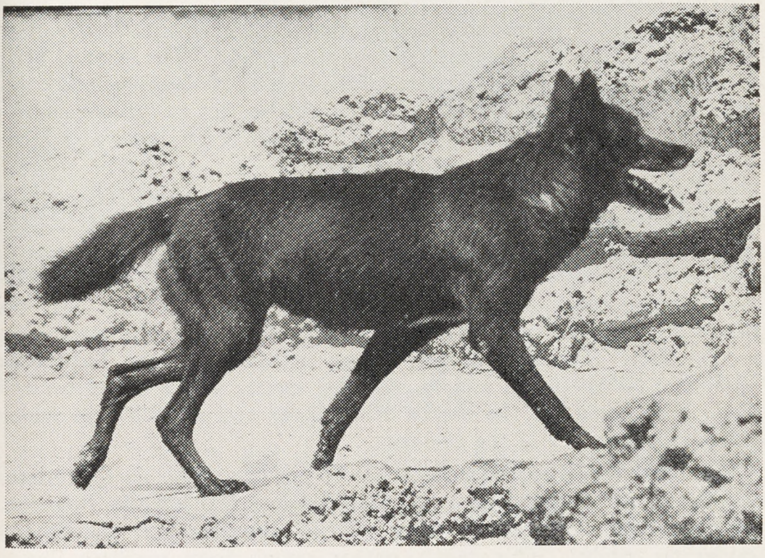
RACCOON DOG *(Nyctereutes procynoides)*



DINGO *(Canis dingo)*



HOG BADGER *(Arctonyx collaris)*



BLACK PHASE OF RED WOLF *(Canis niger gregoryi)*

(Canis nubilis) is the largest of American wild canines and possesses a very formidable reputation. Another American wolf is the **Red Wolf** *(Canis niger gregoryi)* of the southeastern states. Our specimens represent a black or melanistic phase. Smallest of the native wolves is the **Coyote** or **Plains Wolf** *(Canis latrans)* which is distributed throughout western North America and is still fairly numerous in San Diego County.

The **Spotted** or **Laughing Hyena** *(Crocuta crocuta)* is one of the most cowardly and loathsome of living creatures. It is a scavenger, feeding on carrion, and follows the lion. Watching the great cat make its kill, it waits till the latter has had his fill, then sneaks up to finish the remains. Similar in habit, but more attractive, are the **Striped Hyenas** *(Hyæna hyæna)* of North Africa and India. Hyenas, although superficially dog-like, are allied to the true civets of the Old World.

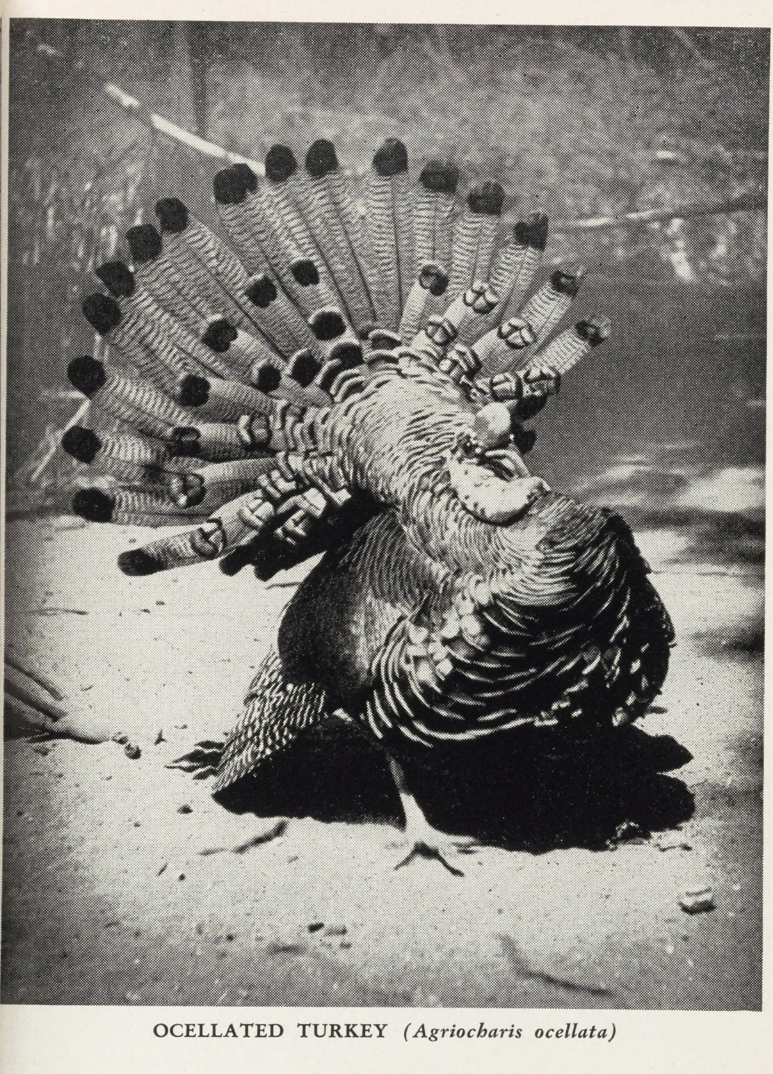
SWINE

The wild swine exhibit never fails to incite the interest of the passing zoo visitor. They seem so little like the familiar domestic forms that it is sometimes difficult to realize that both types originated from the same source.

The **Wild Boar** *(Sus scrofa)* of Europe, Asia and Africa is a fierce and handsome brute. His trim body is covered with a dense coat of coarse fur which becomes especially heavy on the shoulders nape. Curving from the mouth of the boar are four, long razor-like tusks which serve both as weapons and as rooting implements with which he dislodges his favorite tubers from the ground. The young, little resembling their parents, are adorned in suits of longitudinal beige and dark, olive-brown stripes. Hunting this species has always been a favorite sport in Europe and for such purposes it has been introduced into various sections of the United States.

Often called the ugliest of all mammals the **Wart-hog** *(Phacochoerus aethiopicus)* of Africa is indeed a grotesque looking spectacle. The facial protuberances for which it is named, the sparse, drooping mane, and the sweeping tusks account in part for the reputation of this characteristic inhabitant of the veldtlands. Like the Wart-hog, the **Javan Pig** *(Sus verruscosus)* is distinguished by wart-like formations on the face. The star of any swine collection is the **Babirussa** *(Babirussa babyrussa)*, a seldom exhibited species native to Celebes and Buru. It is noted for the length of its tusks and a thick skin which brings to mind that of the elephant.

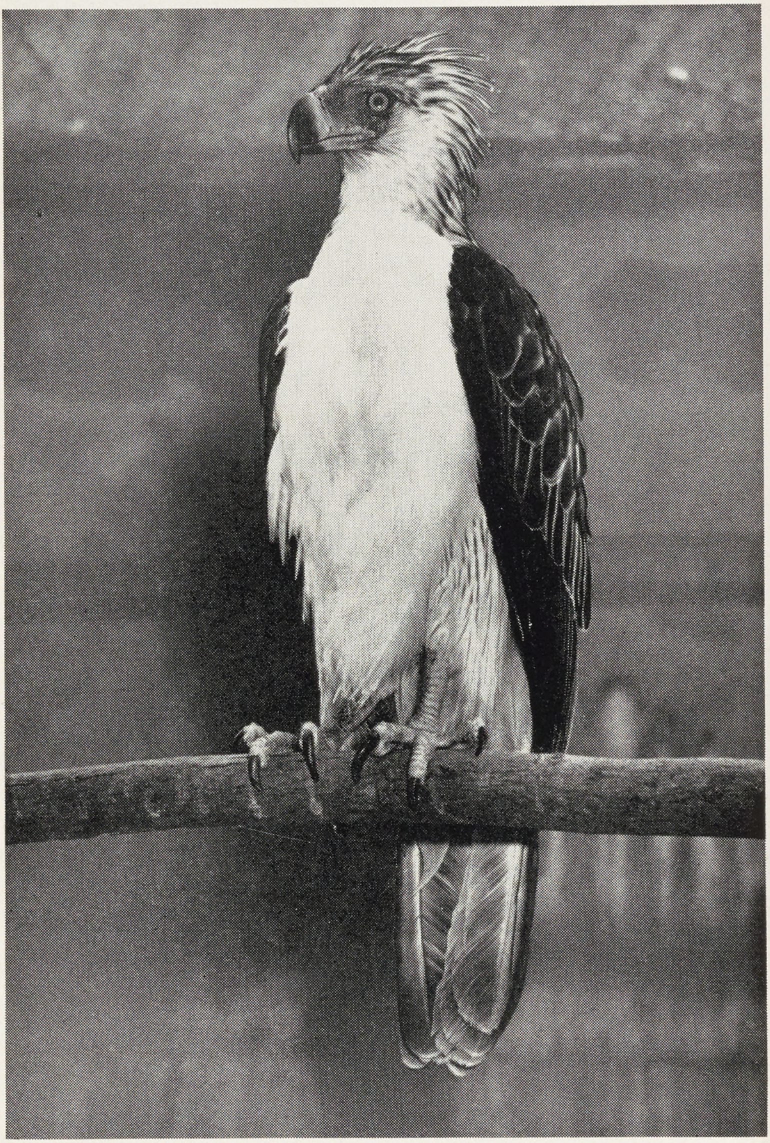
The New World representatives of the pig clan differ enough anatomically to be classified as a separate family, that of the Peccaries. Of these, the **Collared Peccary** *(Pecari angulatus)* is usually the species on exhibit. This dainty porker ranges from southern Texas, New Mexico and Arizona south to the South American pampas.



OCELLATED TURKEY *(Agriocharis ocellata)*

Birds

. . . "B" MESA, "E" CANYON, and MISCELLANEOUS AREAS . . .



MONKEY-EATING EAGLE *(Pithecophaga jeffreyi)*

BIRDS

As we have indicated in our general instructions on the layout of the Zoological Garden, the birds are perhaps more widely distributed throughout the zoo than any other of the families.

On **B Mesa** will be found all of the birds commonly called Cage birds, which include birds of the parrot family (or psittacine birds), the gallinaceous birds, the small finches, weavers, doves, and pigeons, together with the birds of prey and the largest part of the shore and water birds.

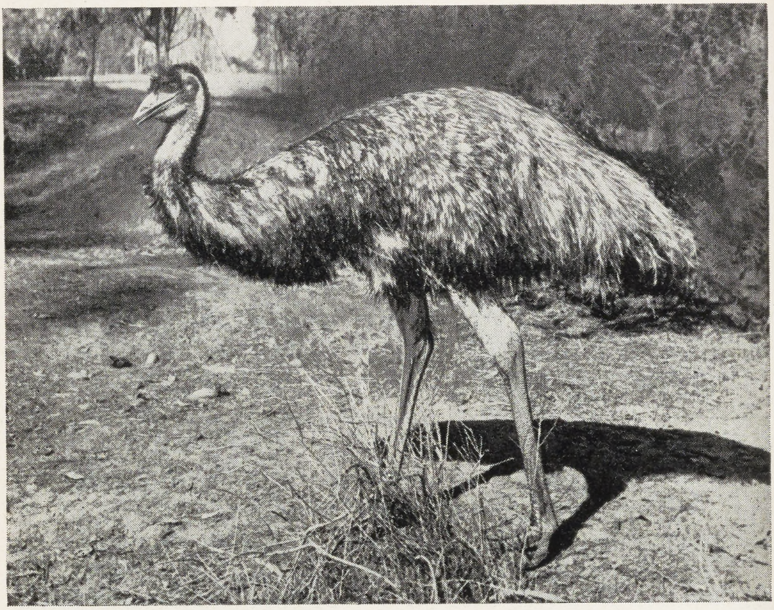
In **E and F Canyons** the larger cranes, storks, flamingos, the swans, ducks, geese, and the ostrich-like birds are exhibited in large open pens containing suitable pools and tropical shrubbery. Here also large and local shore birds share the pools of the seals and sea lions.

In addition to all of these, the wild native birds, especially hummers and seasonal migratory birds, are encouraged to live in the zoo and are protected in every possible way. These, with a few such birds as peafowl, pheasants, jungle fowl, crested screamers and chachalacas which have been released, make almost as varied and valuable an exhibit as those confined in zoo enclosures.

OSTRICHES

Since ancient times, the Ostrich, or Camel-bird, has attracted attention and interest. The Ostrich is the largest bird in existence today. Standing from six to eight feet high, the males weigh from two to three hundred pounds. The voice of the **Ostrich** *(Struthio camelus australis)* is deep and rumbling, like the roar of a lion. It has a running speed of from forty to sixty miles an hour.

The Ostrich is a native of the flatlands of Arabia and Africa. It lives from twenty to thirty years in the wild, but probably less in captivity. The male is deep black with a few scattered white feathers and plumes in the tail and wings. The female is a dusty brown color with white plumes on the wing and tail. The head, neck and legs are without feathers in both sexes. Ostrich eggs are white and large, weighing from three to four pounds each. Twelve to fifteen eggs are usually laid in the nest, which is a shallow depression in the sand scooped out by the birds with their bills.



EMU *(Dromiceius n. novae-hollandiae)*

RHEAS

The Rheas of South America are similar in appearance and habits to the Ostrich. They are, however, much smaller and have three toes on each foot instead of two. They inhabit the pampas country and are sometimes to be seen in large flocks. Both the **Common Rhea** *(Rhea americana)* and **Darwin's Rhea** *(Pterocnemis pennata)* have been exhibited here.

The male rhea incubates the eggs, which are cream-colored, and raises the babies. A number of Common Rheas have been reared here.

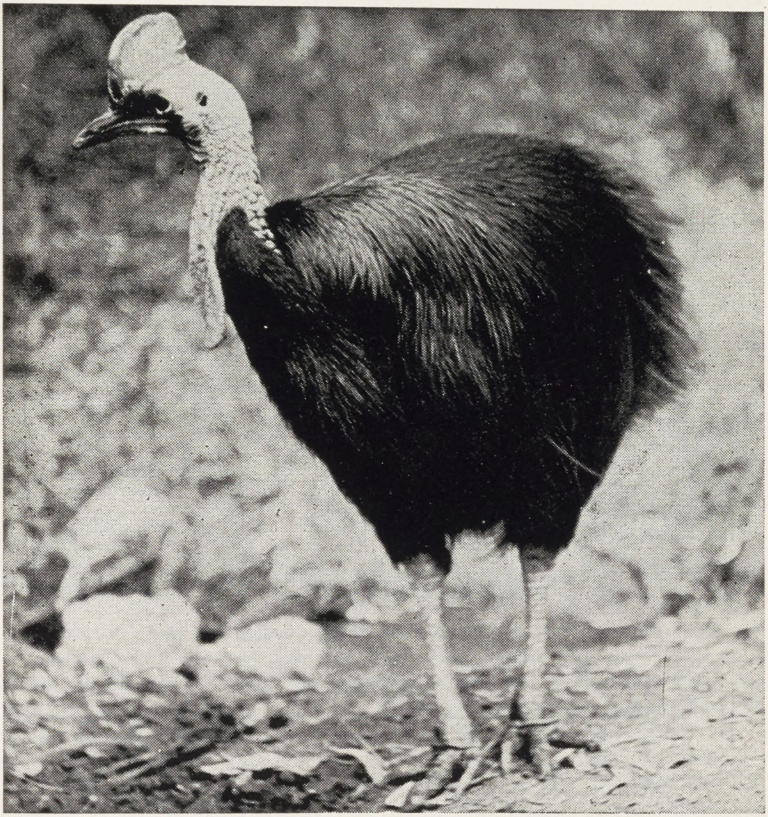
CASSOWARIES AND EMUS

Emus are large and flightless birds, like the Ostrich. The plumage is hair-like with double feathers with two shafts in a single tube. Both Cassowaries and Emus are three-toed and have very strong legs and feet which they use for defense.

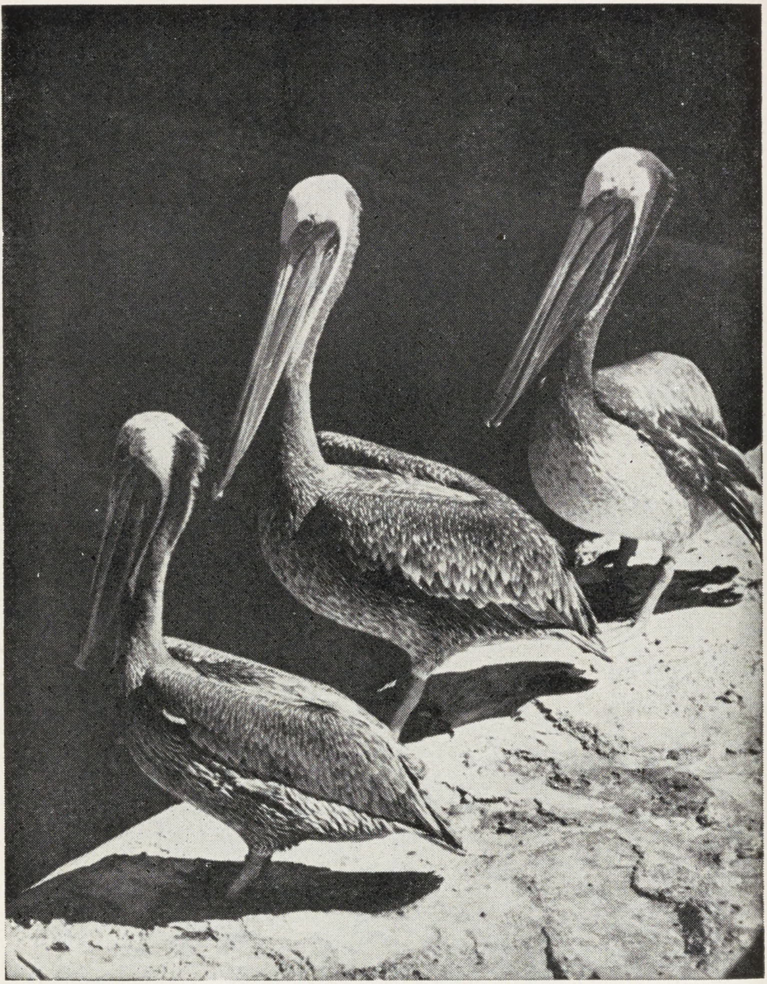
Emus *(Dromiceius n. novæ-hollandiæ)* are found in the deserts and plains of Australia. The general color is grayish brown. The feathers of the head and neck are black, short and curly. The sexes are very much alike.

The eggs are a beautiful dark green and look very much like avocadoes when first laid. They nest in open places near the base of a tree or stump. From eight to twenty eggs are laid, and sometimes two hens lay in the same nest. The males incubate the eggs, as do the cassowaries. Eight weeks of incubation are necessary before the eggs hatch.

Cassowaries inhabit tropical Australia and the islands to the north. They stand five feet in height and differ from emus in having a bony helmet on the forehead. The head and neck are naked and usually brightly colored in rich blue, purple and scarlet. Some cassowaries have wattles on the naked neck. The toes have pronounced claws. The inner nail is four to five inches in length — a straight, powerful, pointed weapon. Cassowary eggs are light green with a beaded surface. The



DOUBLE-WATTLED CASSOWARY *(Casuarius casuarius)*



PERUVIAN PELICAN *(Pelecanus occidentalus thagus)*

eggs vary from five to nine in number and measure five or six inches in length and some three inches across.

A number of cassowaries have been exhibited here, including the **Double-wattled Cassowary** *(Casuarius casuarius aruensis)* from the Aru Islands, the **Single-wattled Cassowary** *(Casuarius unappendiculatus occipitalis)* from Jobi, and the **Wattleless Cassowary** *(Casuarius bennetti hecki)* from the mountains of New Guinea.

TINAMOUS

Tinamous are South American land birds of partridge type, inhabiting the forested regions and grassy plains. Though very fast runners they have limited powers of flight. Their remarkable eggs are oval in shape with a polished waxy shell and a lacquered finish in colors shading from pink to brown. Several species have been exhibited here, among them: The **Rufous Tinamou** *(Rhychotus rufescens)*, the **Guiana Great Tinamou** *(Tinamus major)*, and the **Crested Tinamou** *(Eudromia elegans)*.

PENGUINS

HUMBOLDT PENGUIN ***(Spheniscus humboldti)***

There is little doubt that of all the bird exhibits that of the Penguins is by far the most popular. These droll little creatures, dressed in slick shiny suits of black and cream, are active and unceasingly interesting, performing aquatic acrobatics with awesome skill and speed. Well adapted for swimming, Penguins are characterized by flipper-like wings which, while useless as flight organs, serve as paddles in the water and enable their owners to swim like sealions.

Most penguins inhabit the frigid waters and coasts of the Antarctic but a few species are to be found in south temperate regions and one, the diminutive **Galapagos Penguin** *(Spheniscus mendiculus)* is restricted to the group of equatorial islands whose name it bears. The **Humboldt Penguin** *(Spheniscus humboldti)*, a larger species characterized by a white crescent on each side of its face, inhabits the west coast of South America from Tierra del Fuego to Payta, Peru. The **Magellanic Penguin** *(Spheniscus magellanicus)* is found on both coasts of southern South America. The **Jackass** or **Black-Footed Penguin** *(Spheniscus demersus)*, similar in size and markings to the Humboldt Penguin, is native to the coasts of South Africa. The **Fairy Penguin** *(Eudyptula minor)* of Australia is the smallest of all penguins while the **King Penguin** *(Aptenodytes patagonica)* of southern South America is one of the largest.

PELICANS, GANNETS, CORMORANTS

This group is composed of aquatic birds, all remarkable for some peculiarity, and many of them are really fine and handsome birds. All have the four toes of each foot joined together by a web.

The Pelicans are large birds found throughout the temperate and tropical regions of both hemispheres, three species being found in North America. They have short legs and large wings, some with a wing spread of ten feet. They are strong fliers. The pouch of the pelican is quite large, holding as much as two gallons of water. It is used as a basket to carry the fish which have been caught. The length of the bill varies from fourteen to twenty inches.

The **Eastern White Pelican** *(Pelecanus onocrotalus)* is a large species native to southeastern Europe, India and Africa while the smaller **Pink-backed Pelican** *(Pelecanus rufescens)* occurs in Arabia, Madagascar and Africa. The **American White Pelican** *(Pelecanus erythrorhynchos)* is found throughout temperate North America. There is a very remarkable excrescence near the middle of the upper mandible which is grown only during the breeding season. This adornment is shed soon after the young are hatched.

The **Peruvian Pelican** *(Pelecanus occidentalus thagus)* is rarely seen in zoological collections. This pelican is found along the entire coast of Peru. The skin of the pouch has beautiful blue stripes. The **California Brown Pelican** *(Pelecanus o. californicus)* is very common along our coast. It is one of the smallest members of this family.

The Gannets and Boobies are much smaller than the Pelicans but are more powerful on the wing. The Gannets are birds of temperate and tropical seas and are found great distances from land. Their food consists entirely of fish. The nostrils are completely closed in the adults. These birds are great divers, making forty to sixty foot dives into the water. They may be seen in our large shore and water bird flying cage.

The **Blue-footed Booby** *(Sula nebouxii)* is found along the coast of Mexico to Chile. **Brewster's Booby** *(Sula leucogaster brewsterii)* is found along the Pacific coast of America and in the Indian Ocean. The **Peruvian Booby** *(Sula variegatus)* is larger than the first two forms mentioned and is found along the coast of Peru and Chile.

The Cormorants are long-bodied birds with slender snake-like necks. The upper beak is distinctly hooked. The plumage is generally dark in color and very thick. The feed consists entirely of fish, which the birds chase and catch under water. Both feet and wings are used in swimming.

Brandt's Cormorant *(Phalacrocorax penicillatus)* is found along the Pacific Coast from Vancouver to Cape San Lucas. The throat sac is bright blue. The **Farallon Cormorant** *(Phalacrocorax auritus albociliatus)* is a sub-species of the Double-crested Cormorant. These birds are confined to the coast and inland lakes of the Pacific slope. The throat sac is yellow in color. The **Guanay Cormorant** *(Phalacrocorax bougainvillii)* of the west coast of South America and the **Flightless Cormorant** *(Nannopterum harrisi)* of the Galapagos Islands have also been included in the collection.

The Anhingas are slender, long-necked birds which inhabit swamps and river banks. Two species have been shown here: the **American Anhinga** or **Water-turkey** *(Anhinga anhinga)* and the **Malayan Anhinga** *(Anhinga melanogaster)*.

The Man-o'-war Bird, or Frigate Bird as it is often called, is found only in sub-tropical and tropical seas. It is named from its habit of watching the gannets when they fish, and then swooping upon them and robbing them of their prey.

These birds are wonderful fliers. They have lived a natural life's span in our large flying cage. Including the tail, the body measures some three feet in length. The wing spread is about eight feet. The **Frigate Bird** *(Fregata magnificens)* is found in the Pacific and Indian Oceans to Mexico. Our birds were taken as young birds from the Galapagos Islands.

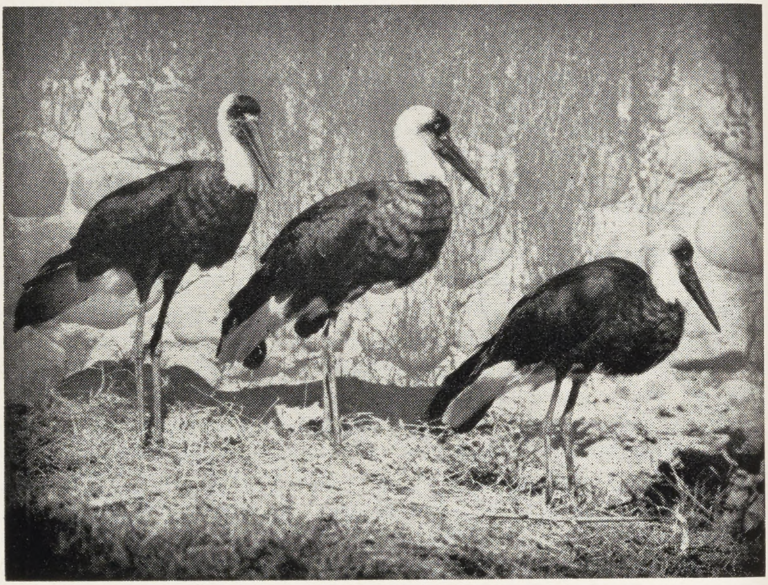
STORKS, HERONS, IBISES AND FLAMINGOS

The **Shoebill** or **Whale-Head** *(Balaeniceps rex)* is well named since its enormous bill bears strong resemblance to a wooden shoe. This grotesque species is found only in Anglo-Egyptian Sudan and adjacent sections in Uganda and the Belgian Congo.

The **Saddle-Billed Stork** *(Ephippiorhynchus senegalensis)* of Africa is by far the handsomest stork we have exhibited. Characteristic of the bill is the fact that it is slightly upturned and atop the bill at its base it bears a soft membranaceous shield of yellow which forms a saddle, hence the name of the bird. The **Black-necked Jabiru** *(Xenorhynchus a. asiaticus)* is a somewhat similar stork native to India and Malaya.

The **European White Stork** *(Ciconia c. ciconia)* breeds in most of continental Europe and in northwestern Africa. This stork is by far the best known of the family in literature and legend. The **Woolly-necked Stork** *(Dissoura episcopus)* is a small species native to Africa and tropical Asia.

The **Indian Adjutant Stork** *(Leptoptilus dubius)* is dusty gray above and white below. The name "Adjutant" originated from its habit of frequenting the parade grounds. This large stork is a native of the Indian peninsula and the Indo-Chinese countries. The smaller **Javan Adjutant Stork** *(Leptoptilus javanicus)* is widely distributed in the Orient and the Indo-Chinese countries also. The **Marabou Stork** *(Leptoptilus crumeniferus)* is a native of tropical Africa. The beautiful and delicate marabou plumes of commerce are found on this interesting bird.



WOOLLY-NECKED STORK *(Dissoura episcopus)*

The **Maguari Stork** *(Euxenura galeata)* is found throughout South America and is one of the handsomest members of the Stork family. Black and white in color, with a bluish bill, this bird has red feet and a red face. The **Jabiru** *(Jabiru mycteria)* ranges from southern Mexico to Argentina, and is the largest of the American storks. It is pure white with the head and neck of coal black, and the base of the neck is deep red. The **American Wood Ibis** *(Mycteria americana)* is found over tropical and temperate America, extending from the southern United States to Argentina. This bird is our most familiar American stork. The tip of the beak is turned downward slightly, much as in the true ibis.

JABIRU STORK *(Jabiru mycteria)*

The **Painted Tantalus** or **Rosy Wood Ibis** *(Ibis leucocephalus)* of tropical Asia is a rare relative that has been shown here.

The members of the Ibis and Spoonbill family differ from the Storks and Herons chiefly in the shape of their beaks. That of the Ibis is slender and curved, while that of the Spoonbill is broad and flattened and does resemble a spoon.

The **Scarlet Ibis** *(Guara rubra)* ranges from Mexico throughout tropical South America. Beyond doubt the most beautiful of all the Ibises, the coloration of this bird is perfect. The plumage is blood red, fading to a pink when kept in captivity for any length of time. The **White Ibis** *(Guara alba)* is found in tropical America also. The plumage is pure white, with black wing tips. The bare face, bill and legs are orange, red, or carmine. This is the bird which is often called the Spanish Curlew. The **White-faced Glossy Ibis** *(Plegadis guarauna)* or **Black Curlew,** is found in tropical and sub-tropical America. It frequents the low, moist grounds about lakes, or over flooded meadows. The **Black-headed Ibis** *(Threskiornis melanocephala)* is a handsome native of India, Ceylon and Burma to China and Japan, and the **Straw-necked Ibis** *(Carphibus spinicollis)* occurs in Australia. The rare **Black-faced Ibis** *(Theristicus melanopis)* of southern South America has also been exhibited.

The **Roseate Spoonbill** *(Ajaia ajaia)* or **Pink Curlew** has white plumage with a roseate tinge. There is a deep carmine patch on each wing. During the breeding season, the under tail coverts are light orange. This bird has a bare head. In some countries the beak is taken from the bird, scraped very thin, polished, and is then used as a spoon. Sometimes these spoons are inlaid with silver.

The Flamingo, with its long neck and legs, is highly specialized in order that it may get food. The bill is bent abruptly downward in the middle, as though deformed. The diet consists of small aquatic creatures, which are strained from the water by means of a comb-like structure in the beak. The **European Flamingo** *(Phœnicopterus antiquorum)* is found from the Caspian Sea to northwestern India, and is also found in southern Africa. In this bird, the general color is white faintly tinged with pink. The wing coverts are scarlet with black tips. The **Chilean Flamingo** *(P. chilensis)* is a similar form native to South America. The **American Flamingo** *(P. ruber)* is much redder and more brilliant.

The herons are almost entirely waders, inhabiting places where the water is shallow, and feeding on fish, frogs, and the like, sometimes eating water rats. The long beak of the heron is very sharp and dagger-like, and can be used with terrific force as an offensive weapon. Set upon a stick, it is used by some savage tribes as a spear. The **European Gray Heron** *(Ardea cinerea)* is found throughout Europe, Asia, Africa and Australia. It is similar to our American Blue Heron. The **Yellow-crowned Night Heron** *(Nyctanassa violacea pauper)* is found in tropical and sub-tropical America. They breed from the south part of Lower California to Brazil and Peru.

The **Nankeen Heron** *(Nycticorax caledonicus)* of Australia is a reddish brown but generally very like the **Black-crowned Night Heron** *(Nycticorax nycticorax hoactli)* or **American Night Heron,** found in North and South America. Two narrow white plumes, seven to eight inches long, are grown during the breeding season by the adult birds. The **Louisiana Heron** *(Hydranassa tricolor ruficollis)* is found in the southern United States and the West Indies. Truly a southern species, this little heron is called the Lady of the Waters, a gentle and graceful member of this interesting family.

EUROPEAN FLAMINGO *(Phoenicopterus antiquorum)*

The **Tiger Bittern** or **Heron** *(Tigrisoma lineatum)* is found from Mexico to Brazil. This striking heron has stripes very similar to those of a tiger. The **Cattle Egret** *(Bubulcus ibis coromandus)* is found throughout Asia and into Africa. This little heron is one of the smallest members of this family.

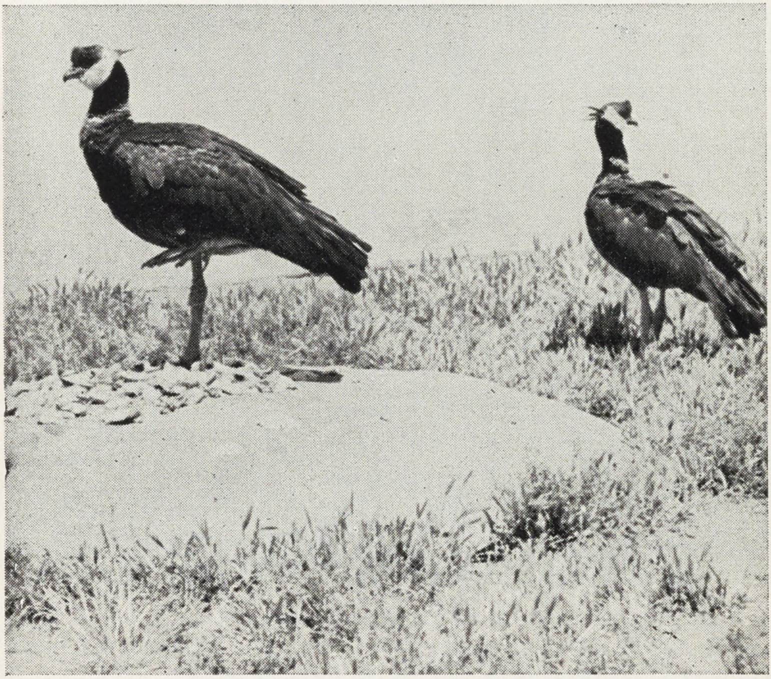
The large egrets form a very interesting and showy group. The **American Egret** *(Casmerodius albus)* ranges in temperate and tropical America to Patagonia. The long white plumes, known as "aigrettes," grow on the back of this bird during the mating season. These birds have a bright yellow bill. The **Snowy Egret** *(Egretta thula)* or **Little Egret** is found in both North and South America. Their "aigrettes" are much shorter, more delicate and recurved at the ends. They have black legs and the feet are bright yellow.

The **Reddish Egret** *(Dichromanassa rufescens)* is distributed throughout tropical America. This egret is reddish gray in color, and is very seldom exhibited. These birds have nested and raised young in our large shore and water bird flying cage.

The **Southern Boatbill Heron** *(Cochlearius c. cochlearius)* ranges from northern South America to southern Brazil. This bird resembles

CATTLE EGRET *(Bubulcus ibis)*

the Night Heron but differs in having a long black crest and a widened beak. This bill is three or four inches in length and some two inches in width. The general color is pearl gray above with the back, rump and tail a darker gray, while the crown and crest are blue-black. The forehead, sides of face, throat and chest are white. The breast and abdomen are a cinnamon brown. The beautiful crest is raised when the bird is frightened or when angry, and the general effect is very like that of an Indian war bonnet.



BLACK-NECKED SCREAMERS *(Chauna chavaria)*

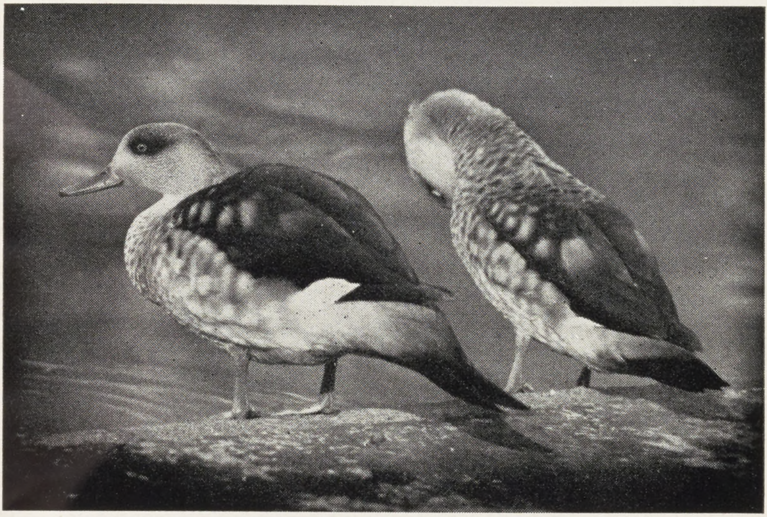
SCREAMERS, SWANS, GEESE AND DUCKS

The Screamer family, which is closely allied to that of the swans, geese and ducks, is limited to South America. Its members are turkey-sized birds with small heads and fowl-like beaks. Their legs are thick and strong, and the toes are remarkably long. Their wings are large and broad and each is armed with two powerful spurs which are used chiefly for defense. They are called screamers because of their shrill, strident cries.

The **Crested Screamer** *(Chauna torquata)* of Paraguay, Brazil, Argentina, and Uruguay is a smoky-gray bird with white cheeks and chin, a narrow black ring about its neck, and a conspicuous tuft of feathers on the back of the head. The feet and legs and the bare skin about its eyes are red. The **Black-necked Screamer** *(Chauna chavaria)* of Colombia and Venezuela is very similar but the black band about the neck is much broader. The **Horned Screamer** *(Anhima cornuta)* of tropical South America has a horn-like projection on the head.

BLACK SWAN ***(Cygnus atratus)***

The **Mute Swan** *(Cygnus olor)* is the swan most frequently kept in captivity. It has a wide range which extends from Europe to Mongolia. It may be recognized by the orange upper bill and the overhanging black knob. The name is misleading since the bird is not mute. The **Whooper** *(Cygnus cygnus)* is an enormous all white species native to northern Europe and Asia. The **Black-necked Swan** *(Cygnus melanocoryphus)* of southern South America is chiefly white with a black head and neck. The knob on the bill is bright red. The **Black Swan** *(Cygnus atratus)* of Australia and Tasmania is, as the name would suggest, black. Its feathers are glossy and those of the wings are curled. The **Whistling Swan** *(Cygnus columbianus)* of North America is pure white. The bill and the feet are black. The **Coscoroba** *(Cos-*



ANDEAN CRESTED DUCK *(Lophonetta specularioides alticola)*

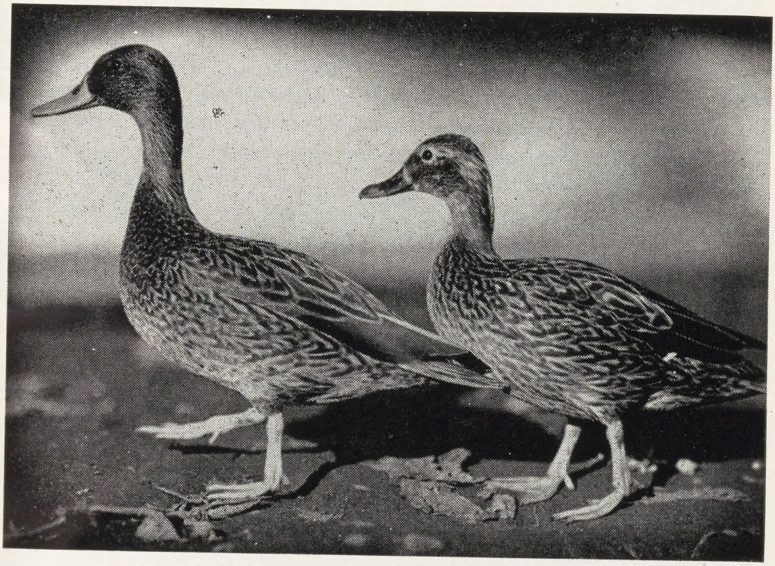
coroba coscoroba) of southern South America is a borderline bird which is most closely allied to the swans, although in shape and proportions it resembles a giant tree duck. It is pure white with a red bill and feet.

The tree ducks are an interesting group which combine characteristics of the typical ducks, geese, and swans. Their long necks and legs and high whistling voices are distinctive. Some members of this group are known to roost and nest in trees, hence the name. The **Fulvous Tree Duck** *(Dendrocygna bicolor)* is the species which inhabits western North America, Mexico and South America. It is chiefly fulvous brown with a black bill. A closely related but smaller form, the **Lesser Fulvous Tree Duck** *(Dendrocygna arcuata)*, is found in the East Indies and Australia. The **Black-bellied Tree Duck** *(Dendrocygna a. autumnalis)* is a handsome species native to the American tropics. Its bright red bill is distinctive. The **Gray-necked Tree Duck** *(Dendrocygna autumnalis discolor)* is a similar form which is restricted to Panama, northern South America and the Lesser Antilles. The appropriately named **White-faced Tree Duck** *(Dendrocygna viduata)* has a most remarkable distribution. It is found in tropical Africa, Madagascar, and South America. Its plumage is brown and black with the exception of the face which is white. The **West Indian Tree Duck** *(Dendrocygna arborea)* is native to the Bahamas, the Greater Antilles, and the northern Lesser Antilles. It is mottled brown in color and has a black bill. **Eyton's Tree Duck** *(Dendrocygna eytoni)* is a rarely exhibited species native to Australia.

The term "goose" is actually a very vague one, for it is used to describe a great many and often very distantly related birds. There is no truly accurate definition of the word. Some "geese" are more closely related to ducks or swans than they are to each other. In this volume, the various forms which are known as geese will be treated together merely for the sake of convenience.

The **Semi-palmate** or **Magpie Goose** *(Anseranus semipalmata)* is a somewhat rare and very primitive form native to Australia and southern New Guinea. The first of its names arises from the partially webbed condition of its feet and the second from its black and white coloration. The **Egyptian Goose** *(Alopochen aegyptiacus)* occurs throughout the major portion of Africa as well as southern Palestine and has been recorded in Europe. The **Orinoco Goose** *(Neochen jubatus)* of the Orinoco and Amazon basins in South America is a distant relative. The **Magellan Goose** *(Chloephaga picta)* is a handsome species native to southern South America. The male is white with black barring, and the female is brown with black barring. In the smaller **Ashy-headed Goose** *(Chloephaga poliocephala)* of the same region, both sexes are colored alike: brown with black barring, and with a gray head. The rare **Andean Goose** *(Chloephaga melanoptera)* is white with black

PARADISE SHELDUCK *(Tadorna variegata)*



HAWAIIAN DUCK *(Anas platyrhynchos wyvilliana)*

wings. The **Cereopsis Goose** *(Cereopsis novaehollandiae)* of the islands off southern Australia is gray with a black bill and a chartreuse cere. The **Maned Goose** *(Chenonetta jubata)* is a miniature species native to the Australian mainland.

The **Lesser Snow Goose** *(Anser caerulescens hyperboreus)* is a handsome white bird with black wing tips. It breeds in northern North America and Siberia and winters in temperate United States and Japan. The **Blue Goose** *(Anser c. caerulescens)* is restricted to eastern North America. The **White-Fronted Goose** *(Anser a. albifrons)* is a small brown bird which breeds in the Arctic and winters south to Mexico, Japan, and the Mediterranean. The closely related **Graylag** *(Anser anser)* is an Old World form which is thought to be the ancestor of most domestic breeds of geese, while the **Swan-Goose** *(Anser cygnoides)* is said to be the progenitor of various domestic geese in the Orient. The **Bar-headed Goose** *(Anser indicus)* is an Asiatic species with conspicuous black bands on the head. The **Emperor Goose** *(Anser canagica)* inhabits the coasts of Alaska and Siberia.

The **Canada Geese** are represented in the zoo by several forms, all of which have brown bodies, black necks, and white cheeks: the largest of these is the **Common Canada Goose** *(Branta c. canadensis)*. Others include the **White-cheeked Goose** *(Branta canadensis occidentalis)*, **Hutchins Goose** *(Branta canadensis hutchinsi)* and the **Cackling**

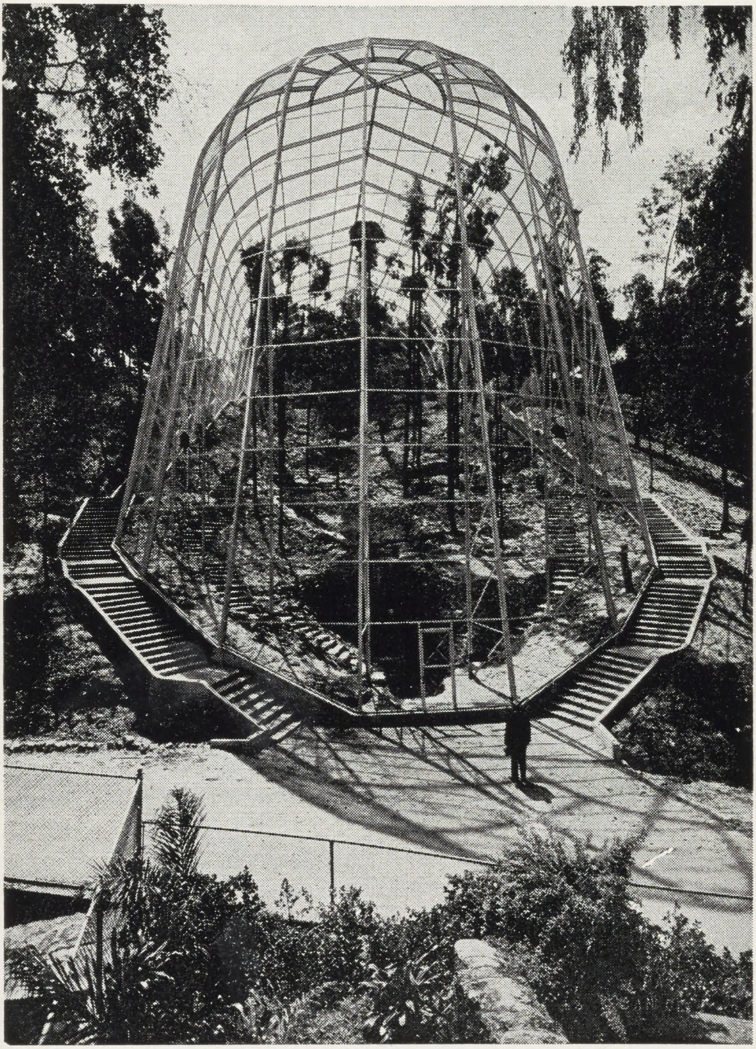
Goose *(Branta canadensis minima)*. The **Black Brant** *(Branta bernicla nigricans)* is a small marine member of the group. It breeds in the Arctic and migrates to southern California in winter. The **Bernicle Goose** *(Branta leucopsis)* breeds in northern Europe and Asia and the rarely exhibited **Red-breasted Goose** *(Branta ruficollis)* nests on the Siberian tundra. The last named species is undoubtedly the handsomest of its clan.

North American ducks are always well represented in the collection, and the following are to be looked for on zoo pools: **Pintail** *(Anas acuta tzitzihoa)*, of which thousands of wild specimens winter in the zoo, **Green-winged Teal** *(Anas crecca carolinensis)*, **Black Duck** *(Anas fulvigula rubripes)*, **Mallard** *(Anas p. platyrhynchos)*, **Gadwall** *(Anas strepera)*, **Baldpate** *(Anas americana)*, **Blue-winged Teal** *(Anas discors)*, **Cinnamon Teal** *(Anas cyanoptera)*, **Common Shoveller** *(Anas clypeata)*, **Canvas-back** *(Aythya valisineria)*, **Redhead** *(Aythya americana)*, **Ring-necked Duck** *(Aythya collaris)*, **Lesser Scaup** *(Aythya affinis)*, **Surf Scoter** *(Melanitta perspicillata)*, **American Goldeneye** *(Bucephala clangula)*, and **Ruddy Duck** *(Oxyura jamaicensis)*.

The **Wood Duck** *(Aix sponsa)* is considered to be the most beautiful of the North American ducks. It breeds sparingly throughout the temperate portions of the continent and nests in trees. A closely related and very similar form, the **Mandarin Duck** *(Aix galericulata)*, inhabits eastern Asia.

Of the many exotic ducks which the collection has contained at one time or another, probably the rarest is **Baer's White-eyed Duck** *(Aythya baeri)* which inhabits eastern Asia. It is a drab little duck, the male of which has white eyes; hence, the name. Our specimens, which came from Siam, are believed to be the first to be exhibited in North America. The **Red-Crested Pochard** *(Netta rufina)* of Asia and northern Europe and the **Rosy-billed Duck** *(Netta peposaca)* of South America are two other pochards that have been shown here.

The **Bahama Pintail** *(Anas bahamensis)* is a handsome, white-cheeked species native to the Bahamas, the Antilles, and northern South America. The **Yellow-billed Duck** *(Anas poecilorhyncha zonorhyncha)* of eastern Asia, the **Australian Black Duck** *(Anas poecilorhyncha supersiliosa)* of Australia and Tasmania, and the rare **Koloa** or **Hawaiian Duck** *(Anas platyrhynchos wyvilliana)* are all members of the mallard clan. The **European Widgeon** *(Anas penelope)* is a grayish duck with a cinnamon colored neck and head and a gold forehead, and the **Chiloe Widgeon** *(Anas sibilatrix)* of South America has a white forehead with a greenish purple nape and hindneck. The **Garganey Teal** *(Anas querquedula)* is a small Old World species which is chiefly gray in color with a white crescent over the eye. The remarkable **Comb Duck** *(Sarkidornis melanotos)* is a heavy bodied bird with white undersides, an iridescent black back, a speckled head, and a black knob on top of the bill. The Old World form *(melanotus)* inhabits Asia and Africa and another *(carunculatus)* is to be found in



BIRD OF PREY CAGE

eastern tropical South America. The little known **Andean Crested Duck** *(Lophonetta specularioides alticola)* inhabits western South America at high altitudes.

The **Muscovy** *(Cairina moschata)* is a large black duck native to the American tropics and from it the domestic form has been derived.

ANDEAN CONDOR, MATURE *(Vultur gryphus)*

The wild form is bred in the zoo each year and there are a number of specimens flying loose in the grounds.

The **European Shelduck** *(Tadorna tadorna)* is one of the handsomest members of the entire family. It is white beneath, brown on the back, has a greenish-black head, a chestnut stripe across the breast, and a bright pink bill. Closely related are the **Ruddy Shelduck** *(T. ferruginea)* of Europe and Asia, the rare and beautiful **Paradise Shelduck** *(T. variegata)* of New Zealand and the **White-headed Shelduck** *(T. radjah rufitergum)* of Australia.

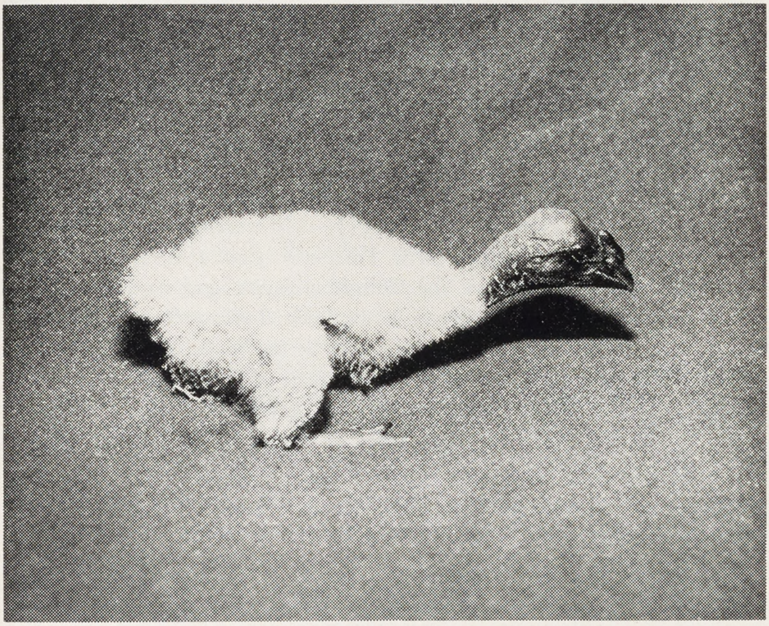
VULTURES, EAGLES, FALCONS AND HAWKS

The birds of this group seek their food by daylight and are chiefly flesh eaters and birds of prey. Either the feet or the beak or both are adaptable to their feeding habits. The powerful, tearing bill of the vultures and the strong talons of the eagles and hawks are well known to everyone. Time and space in this guide book do not permit the description of each member of this order so they will only be listed.

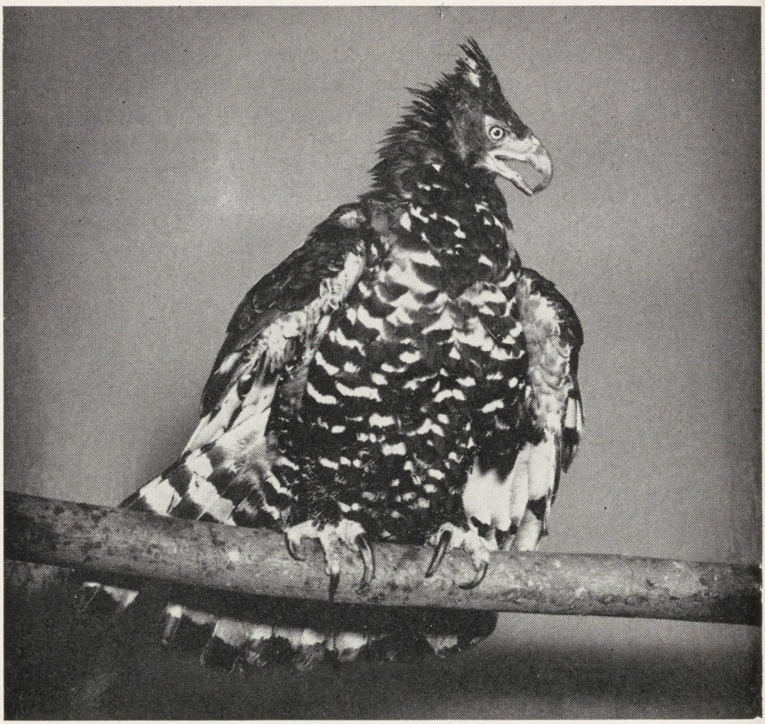
The **Secretary Bird** *(Sagittarius serpentarius)* is a long-legged, long-necked hawk which inhabits the African velt. It feeds upon small mammals, small birds, and reptiles.

The New World Vultures are slow, sluggish birds, feeding on carrion and have slightly hooked beaks and perforated nostrils. The feet have no grasping power. These birds excel in soaring and are past masters in flying. The **Andean Condor** *(Vultur gryphus)* inhabits western South America from Venezuela to Patagonia. This is the largest of the birds of prey. One male on exhibit in our large flying cage has a wing spread of ten feet two inches from tip to tip. In color the male condor is glossy black with an ashy white bar across each wing. The base of the neck has a beautiful ruff or large collar of snow-white resembling a lady's powder puff.

Seven Andean Condors have been hatched and raised here.



INCUBATOR-HATCHED ANDEAN CONDOR



CROWNED EAGLE *(Stephanoaetus coronatus)*

The **California Condor** *(Gymnogyps californianus)* is now among the rarest of North American birds. Formerly it occurred in mountainous country as far north as the Columbia River and as far south as Lower California. Now it appears to be limited to southern California, being most numerous in a protected area in the mountains of Ventura County. This great vulture has a wingspread of from eight and a half to eleven feet. It feeds chiefly on carrion. A breeding pair of Condors is said to rear one baby every two years, as is true of the Andean species. The California Condor has no comb; the naked skin of its head is deep orange. Its plumage is black except for an area of white beneath each wing. The species was exhibited here for eleven years.

The **Black Vulture** *(Coragyps atratus)* is found throughout the whole of tropical and the warm temperate sections of America. This is one of the smallest vultures and mainly an eastern one. The **Turkey**

Vulture or **Turkey Buzzard** *(Cathartes aura septentrionalis)* is one of the most familiar and most widely distributed members of this group. It is found over nearly the whole of temperate and tropical America, including the West Indies. The **King Vulture** *(Sarcoramphus papa)* lives in tropical America, from Mexico to northern Argentina. This vulture is the most brilliantly colored and striking of all. It is a forest loving bird, and four years are required before it attains the brilliant mature plumage.

BALD EAGLE *(Haliaetus leucocephalus leucocephalus)* © 1944

With a few exceptions, the Old World Vultures are large birds with strong feet, rather blunt claws, and featherless head and neck. They all feed more or less on carrion.

Griffon or **Fulvous Vultures** *(Gyps fulvus)* range over eastern Europe, nearly the whole of Africa, and on through Persia to India and the Malay peninsula. They prefer open country and nest on rocks. The **Pondicherry Vulture** *(Torgos calvus)* is found in the Indian peninsula and among the Indo-Chinese countries. This is one of the so-called Eared Vultures, taking its name from certain naked, fleshy folds or lappets on the sides of the head. The **Nubian Eared Vulture** *(T. tracheliotus nubicus)* of North Africa is similar but larger. The **Indian Vulture** *(Pseudogyps bengalensis)* is another large black vulture from India. The **Egyptian Vulture** *(Neophron p. percnopterus)* is a small white vulture with an orange-yellow head.

In the group of Eagles are found birds familiar to us for their strength and ferocity. Unlike the vultures, they have the ability to clutch with the feet. Generally Eagles feed only on living prey. The **Golden Eagle** *(Aquila chrysætos)* is found in North America as far south as Mexico, and is also known in various parts of Europe and northern Asia. It is also found in northern Africa and China.

The **Bald Eagle** *(Haliaeetus leucocephalus)* of North America feeds mainly on fish and is found only near water. **Steller's Sea Eagle** *(H. pelagicus)* of northern Asia is the largest of all eagles and rare in captivity. The **White-breasted Sea Eagle** *(H. leucogaster)* occurs from India to Australia. The short-tailed **Bateleur** *(Terathopius ecaudatus)* inhabits Africa as does the smaller black and white **Vulturine Fish Eagle** *(Gypohierax angolensis)*, and the enormous **Wedge-tailed Eagle** *(Uroastus audax)* is found in Australia. The spectacular **Philippine Monkey-eating Eagle** *(Pithecophaga jefferyi)* is a seldom exhibited, forest species. One of the three specimens that have been shown here was the first ever imported to North America.

Crowned Eagles *(Stephanoætus coronatus)* are numerous in eastern South Africa. This species has a large conspicuous black crest of numerous long feathers. The legs are feathered all the way to the feet. The magnificent **Harpy Eagle** *(Harpia harpyja)* of the American Tropics has also been exhibited here.

The Hawks are generally smaller than the Eagles, though many are as swift and fierce. Their main food consists of small birds and mammals. The shyness and natural wildness of these birds make them unsatisfactory as exhibits. Among the American hawks we exhibit are the **Marsh Hawk** *(Circus hudsonius)*, a bird of wide distribution in the United States; the **Western Goshawk** *(Astus atricapillus striatulus)*, which inhabits the Arctic parts of the Pacific Coast; the **Harris Hawk** *(Parabuteo unicinctus harrisi)*, found in southwestern United States; the **Western Red-tailed Hawk** *(Buteo borealis calurus)*, widely distributed in western North America and the most common of our Hawks to be seen. This bird is much darker than the stock form. **Swainson's Hawk** *(Buteo swainsoni)* is widely distributed in North and South America. The **Galapagos Hawk** *(Buteo galapagoensis)* is a rarely exhibited member of this group.

The **Crested Hawk** *(Spizætus tyrranus)* is one of the South American hawks, and is found in the interior of Brazil and north to Panama. The **Tawny Hawk** or **Eagle** *(Heterospizias meridionalis)* ranges from Brazil north to Colombia. The **Whistling Hawk** *(Haliastur sphenurus)* from Australia is one of the swiftest flying of our foreign hawks on exhibit. **Brahminy Kites** *(Halister indias)* range from India to Australia. This is a striking red and white bird with the entire back red, and a white front. Each feather is faintly penciled with black. The

Yellow-billed Kite *(Milvus migrans aegyptius)* is native to Egypt.

The family of Falcons obtain their food by striking it while on the wing. This family includes the Carrion Hawks as well. Their savage disposition, swiftness of flight, and keen vision are the reasons for their being employed in the art of Falconry for centuries. This art is still practiced today in the Orient, and to some extent in North America.

The **Duck Hawk** or **Peregrine Falcon** *(Falco peregrinus anatum)* is distributed throughout North and South America. Among birds, it has no superior and is truly one of the most beautiful of our North American hawks. The **Prairie Falcon** *(Falco mexicanus)* ranges from the eastern border of the Great Plains to southern Lower California and Mexico.

The Caracaras are vulture-like hawks found in Central and South America. Being chiefly carrion eaters, they are valuable in the cattle districts of South America. **Audubon's Caracara** *(Polyborus cheriway)* ranges from the southern border of the United States south through Mexico to Guiana and Ecuador. It is a shy, hardy bird, living well in captivity. The **Carunculated Caracara** *(Phalcobaenus megalopterus carunculatus)* is native to Colombia and Ecuador. This handsome black and white hawk is rarely exhibited. The **Chimachima** *(Milvago chimachima)* is a small species that occurs from Panama to Argentina.

The **Osprey** or **Fish Hawk** *(Pandion haliætus)* enjoys an almost cosmopolitan distribution, being absent only from southern South America, New Zealand, Iceland, and some parts of Australia.

OWLS

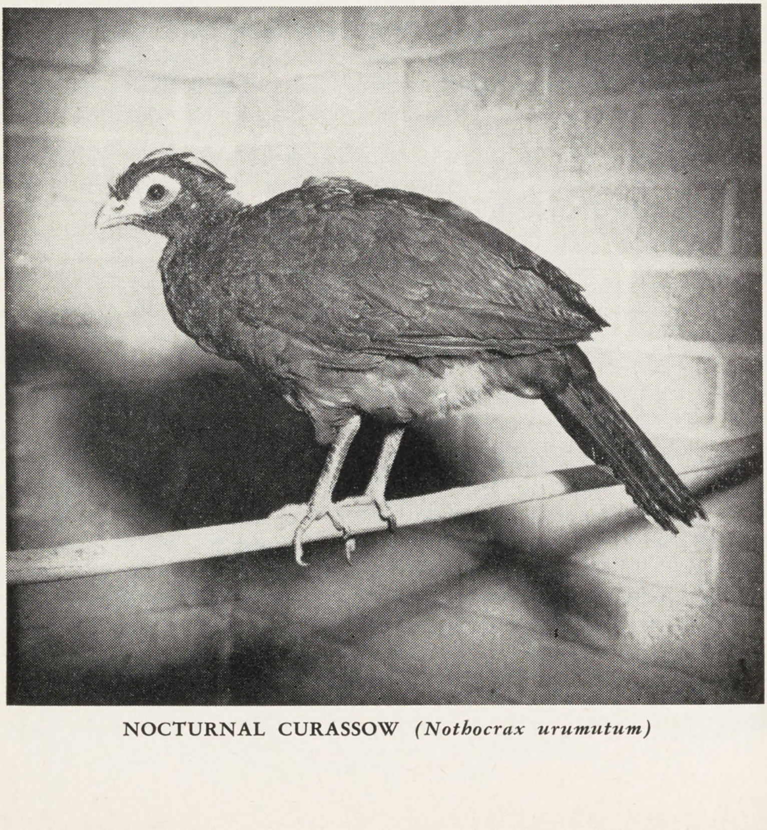
There are few groups of birds which are so decidedly marked as the Owls, and so easy to recognize, consequently they are well known to every one. Owls, almost without exception, are nocturnal in their habits. Two toes of each foot are directed forward and two backward; all are armed with sharp, curved claws.

Among the owls usually on exhibit in the zoo are the **American Barn Owl** *(Tyto alba pratincola)* commonly called "Monkey-faced" Owl; the **American Long-eared Owl** *(Asio wilsonianus)*; the **Short-eared Owl** *(Asio f. flammeus)*; and the Horned Owls of America, including the **Great Horned Owl** *(Bubo v. virginianus)* of eastern North America; the **Western Horned Owl** *(Bubo v. pallescens)* of the western United States, and the very dark **Dusky Horned Owl** *(Bubo v. saturatus)* of the Pacific Coast region.

Other native owls that have been shown here include the **Barred Owl** *(Strix varia varia)* of eastern and southern United States, the diminutive **Screech Owl** *(Otus asio bendirei)* of the coastal regions of southern California, the diurnal **Burrowing Owl** *(Speotyto cunicularia hypogaea)* of the southwestern states, and the insectivorous **Elf Owl** *(Micrathene whitneyi)* of the desert areas.

A number of exotic forms have been exhibited, the most spectacular of which is the **Fishing Owl** *(Bubo ketupa ketupa)* of Malaya and Indonesia. The **Spectacled Owl** *(Pulsatrix perspicillata)* of the American tropics owes its name to the conspicuous ring around each eye. The **Boobook** *(Ninox novaeseelandiae boobook)* is a small form native to eastern Australia, while the Barn Owl group is represented in the "land down under" by the **Masked Owl** *(Tyto novaehollandiae)* and the **Grass Owl** *(Tyto longimembris walleri)*.

The **Snowy Owl** *(Nyctea scandiaca)* is an enormous Arctic species that occurs in both Eastern and Western Hemispheres. It is partially migratory and sometimes invades northern United States in considerable numbers during the winter months.



NOCTURNAL CURASSOW *(Nothocrax urumutum)*

PHEASANTS, QUAILS, GROUSE AND OTHER FOWL-LIKE BIRDS

This group of birds is a large one and is world-wide in distribution. To this order belong the domestic poultry, the grouse, partridges, and quails, the turkeys, pheasants and many other useful and interesting birds.

The **Brush Turkey** *(Alectura lathami)* or **Australian Mound Builder** is found chiefly in southern Australia. Most species in this family gather large quantities of decaying vegetation, brush them into a mound, lay their eggs and cover them with more vegetation. The heat generated by the decaying vegetation hatches the eggs. This species is very hardy and is kept in one of the large flying cages. The general color is black with bare reddish head and yellow neck wattle.

The Curassows, Guans and Chachalacas are natives of forests of tropical America. They are large and heavy with powerful legs and feet. The males are usually purplish black in color with white underparts and crested heads and brilliant wattles.

The **Crested Curassow** *(Crax rubra rubra)* occurs from Mexico south to Ecuador while the somewhat similar **Daubenton's Wattled Curassow** *(Crax alberti daubentoni)* inhabits British Guiana and Venezuela. The **Razor-bill** *(Mitu mitu)*, so-called because of its vertically compressed red beak, is native to the Amazon forests. Rarest of the forms shown here is the **Nocturnal Curassow** *(Nothocrax urumutum)* of Ecuador, Peru and Brazil.

The guans, smaller birds than the curassows, have similar habits. The general color is black or brown with variations. The **Purplish Guan** *(Penelope purpurascens purpurascens)* inhabits most of Central America and Mexico. The **Crested Guan** *(Penelope jacquacu)* and the **Pileated Guan** *(Penelope pileata)* come from Brazil.

The chachalacas are still smaller than the guans. Their general color is olive brown. The **Northern Chachalaca** *(Ortalis vetula maccalli)* is found from southern Texas to Mexico and the **Red-tailed Chachalaca** *(Ortalis ruficauda)* of Venezuela are numerous and run loose in the Gardens. They raise their young each year in the park and are as tame as domestic chickens.

The Pheasants are ground-loving birds, running with great speed, and always prefer to trust their legs rather than their wings. Many of the species live well and breed easily in captivity, so they are always interesting exhibits. Sometimes to be seen here is the rare and beautiful **Malayan Argus Pheasant** *(Argusianus argus)* so called because the eye-like spots on the wing feathers of the male bring to mind the hundred-eyed Argus of mythology. The **Impeyan Pheasant** *(Lophophorus impejanus)* is one of the most brilliantly colored birds in our collection. The metallic hues of fiery red, green, purple, and gold vie in beauty and in their iridescent quality with the brightest of those seen among the humming-birds. Its home is in the Himalayas, from Afghanistan to Bhutan at an elevation of 14,000 feet. The **Palawan Peacock Pheasant** *(Polyplectron emphanum)* is another rare species which has been shown here.

The **Golden,** the **Amherst,** and the **Ringneck** are shown in the flying cage (B-5). The **Blue-eared Pheasant** *(Crossoptilon auritum)* from western China is one of the Eared Pheasants, which were named because of a pointed tuft of white feathers on each side of the head.

The **Silver Pheasant** *(Gennæus leucomelanos melanotus)* is Himalayan in distribution and large numbers roam at liberty in the zoo.

The jungle fowl, which are closely related to the typical pheasants, are the ancestral forms from which domestic chickens were derived. The **Red Jungle Fowl** *(Gallus g. gallus)* have an original habitat of south and central India, the lowland belt at the foot of the Himalayas, Assam, Burma, Ceylon, and throughout all the countries to the southward. The **Gray Jungle Fowl** *(Gallus sonneratii)* is native to western and southern India and the **Green Jungle Fowl** *(Gallus varius)*, perhaps the finest of the lot, inhabits the East Indies.

Peafowl may safely be termed the most magnificent of the feathered

VULTURINE GUINEAFOWL *(Acryllium vulturinum)* tribe. These birds are at once recognized by their beautiful trains, found in the males. They roam loose in our Gardens and attract attention on each mesa and canyon. The **Indian** or **Blue Peafowl** *(Pavo cristatus)* from India and Ceylon, and the **Green** or **Javan Peafowl** *(Pavo muticus)* from Burma and Siam, are shown.

Most popular of all American quails of course is the **Bob-white** or **Virginia Quail** *(Colinus v. virginianus)*. The **Masked Bob-white** *(C. v. ridgwayi)* is a nearly extinct form native to Arizona and Sonora.

The **California Quail** *(Lophortyx c. californica)*, an elegant, graceful and lively native quail, wins new friends every day with his little bobbing crest—seen throughout the gardens in complete freedom. The **Rock Bush Quail** *(Perdicula argoondah)* and the **Rain Quail** *(Coturnix coromandelica)* are interesting little quails from India. The smallest of all the quail family are the little **Painted Quail** *(Excalfactoria chinensis)* or **"Button Quail"** from the Philippine Islands. The **Bamboo Partridge** *(Bambusicola thoracica)* is a handsomely marked species native to China and Formosa, while the **Chukar** *(Alectoris graeca)* has a wide distribution in Europe and Asia. **Ruppell's Francolin** *(Francolinus africanus gutturalis)* is a partridge-like bird native to Ethiopia.

All the Guineafowl come from Africa. Some thirty-five forms are known. The domesticated guineafowl is believed to have been derived from the **West African Wild Guineafowl** *(Numida meleagris galeata)*. Guineafowl are, like the peacocks, liberated in the zoo. The **Vulturine Guineafowl** *(Acryllium vulturinum)* of the East African deserts is so-named because of its naked head. The most remarkable form we have exhibited is the **Cameroon Straight-crested Guineafowl** *(Guttera plumifera plumifera)*.

The Turkeys are the largest, or the heaviest, of the game birds and are too well known as domesticated birds to need any description. In its original habitat, the wild turkey ranges from the Atlantic Coast to as far north as the Dakotas, and from southern Ontario to southern Mexico. **Merriam's Turkey** *(Meleagris gallopavo merriami)* and the **Rio Grande Turkey** *(Meleagris gallopavo intermedia)* are two of the forms running loose in the Zoological Gardens. Rarest of the turkeys is the beautiful **Ocellated Turkey** *(Agriocharis ocellata)* of Yucatan, Guatemala and British Honduras. It is so called because of the "ocelli" or eye-spots on the terminal ends of the feathers.

CRANES, RAILS, AND HEMIPODES

The Cranes are long-legged, long-necked birds similar to the Herons but distinguished from them in flight by carrying their necks extended at full length. The wing feathers are extended into a long sweeping cover for the short tail, adding grace and beauty.

The **Manchurian Crane** *(Grus japonensis)* is a large black and white species which nests in Siberia and migrates to China and Japan

FLORIDA SANDHILL CRANE *(Grus canadensis pratensis)*

while the **White Crane** *(Grus leucogeranus)* occurs only on the mainland. The **Common Crane** *(Grus grus grus)* and **Lilford's Crane** *(Grus grus lilfordi)* inhabit Europe and Asia, respectively. Similar are the **Little Brown Crane** *(Grus canadensis tabida)* of western North America and the **Florida Sandhill Crane** *(Grus canadensis pratensis)*. The **Sarus** *(Grus antigone antigone)* of India is the largest of all cranes and is represented by the smaller **Sharpe's Crane** *(Grus antigone sharpii)* in Malaysia and the **Companion Crane** *(Grus rubicunda)* in

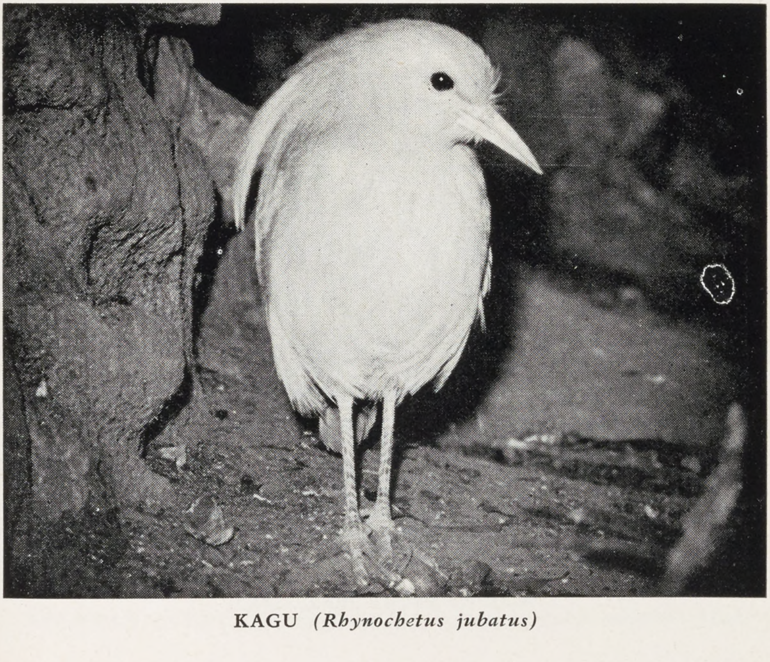
Australia. The **White-naped Crane** *(Grus vipio)* is a lovely bird native to eastern Asia.

Smallest of all cranes is the **Demoiselle** *(Anthropoides virgo)*, native to southern Europe, western Asia and north Africa. The **Stanley** or **Paradise Crane** *(Anthropoides paradisea)* is closely related and occurs in South Africa.

The **Crowned Cranes** *(Balearica pavonina)* of Africa are characterized by their lovely gray and black plumage, pink and white cheek patches, and golden crests. We have exhibited two forms here: the **Cape** *(regalorum)* and the **Sudanese** *(ceciliæ)*.

The rails are small birds, living in swampy, marshy regions, with very secretive habits. The rails have more or less pervious nostrils; long slender toes; a compressed body, and short tail.

Of our native North American species, we usually have on exhibit the **Western Clapper Rail** *(Rallus obsoletus)*, the smaller **Virginia Rail** *(Rallus l. limicola)* which is darker in color than the Western Clapper, but similar, and the little **Sora** or **Carolina Rail** *(Porzana carolina)*, with its short, stout bill. Also on exhibit is the small **Rufous** or **Red Rail** *(Creciscus cayennensis)* found in Brazil and other parts of South America. The **Banded Landrail** *(Hypotænidia philippensis)* from Australia and the Philippine Islands is another beautiful foreign



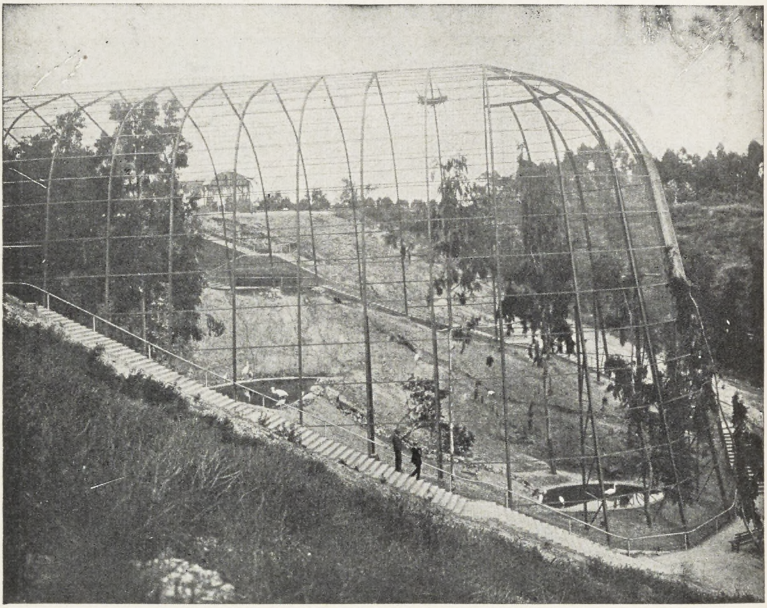
KAGU *(Rhynochetus jubatus)*

rail. The **Cayenne Wood Rail** *(Aramides cajanea)* and the **White-throated Crake** *(Laterallus albigularis)* are two representatives from the American tropics.

The gallinules are birds with a rich and variegated plumage. The **American Purple Gallinule** *(Porphyrula martinica)* has been called the most beautiful of our southern water birds and is found in the tropical and sub-tropical regions of America. The head, neck and breast are deep blue; the back and wings are olive-green. The frontal shield is bright blue and the beak is red. The legs are a brilliant yellow. We have bred and raised this water bird in captivity and the young are now on exhibition. The **Black-backed Gallinule** *(Porphyrio poliocephalus melanotus)* of Australia is one of the largest Gallinules and is similar in coloration, but the colors are not so vivid. The coots are black dumpy birds closely related to the rails and gallinules. Both the native **American Coot** *(Fulica americana)* and the **Yellow-billed Coot** *(Fulica leucoptera)* of South America have been shown here.

The **Barred Hemipode** *(Turnix suscitator)* of Asia resembles a quail but it is related to the rails. The **Sun Bittern** *(Eurypyga helias)* of tropical America is also allied to the cranes and rails.

The **Kagu** *(Rhynochetus jubatus)* is truly an individual among birds. It is confined to the island of New Caledonia in the South Seas.



SCRIPPS SHORE BIRD CAGE
At time of construction—1922

Uniform gray in color, it has a beautiful crest of long feathers which it spreads when frightened or when displaying during the breeding season. One of the specimens on exhibit was presented by Admiral William Halsey while the others were donated to the zoo by Admiral Paul Hendren. The general appearance of this bird resembles that of a Night Heron when first seen, but it is more closely related to the Sun Bitterns.

The Seriemas are tall, long-legged birds, crane-like in appearance with strong, slightly hooked beaks. They also look like the Secretary Bird. Their diet includes snakes, lizards, small mammals and insects. They are hardy birds and live well in captivity, but are notorious as egg eaters, going from one nest to another when confined with other birds. The **Crested Seriema** *(Cariama cristata)* is brown and is found in Brazil, Argentina and Paraguay, while the small gray **Burmeister's Seriema** *(Chunga burmeisteri)* is found only in northwestern Argentina.

The Trumpeters are small, primitive members of the crane clan which inhabit the swampy forests of tropical South America. All three species are black with the exception of the wing coloration. The **Green-winged** *(Psophia viridis)* and the **Gray-backed** *(Psophia crepitans)* have been shown here.

SHORE BIRDS, GULLS, ETC.

The oyster-catchers are stout bodied birds usually black and white or brown and white in color. **Frazar's Oyster-catcher** *(Hæmatopus frazari)* is found throughout the coastal regions of Lower California. One specimen received in 1928 is still on exhibit.

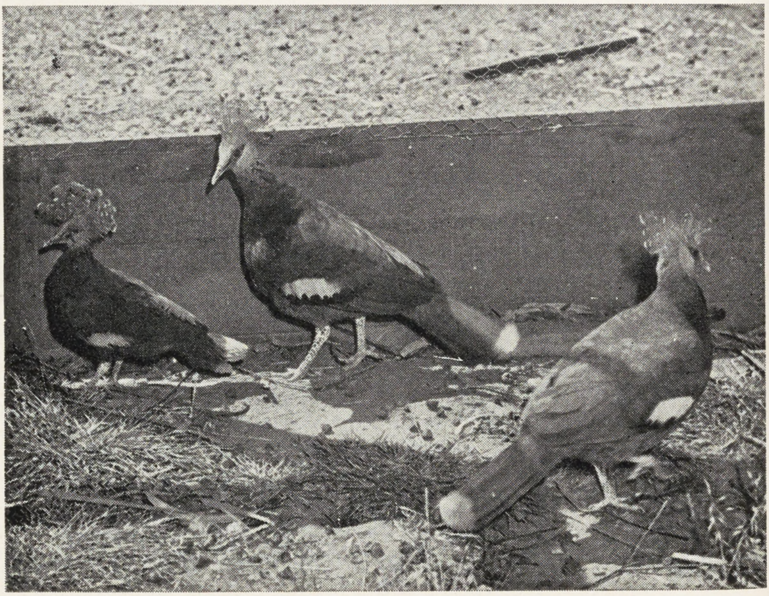
The true plovers are usually short-legged birds, with rounded heads and prominent eyes, frequenting ocean shores, river banks, or the borders of marshes or meadows. Difficult to keep in captivity, we have exhibited them at times. The **Killdeer** *(Charadrius vociferus)* or Chattering Plover is a handsome little individual, native to both North and South America. A member of the large shore-bird family it is usually to be found near the water or in moist places. Here on the Pacific Coast in California our lawns are sometimes covered in the early morning with these attractive little Plovers. The Killdeer gets its name from its repeated loud cry resembling the words, "Kill-deer" or "Kill-dee." The **Snowy Plover** *(Aegialitis nivosa)* of the Western United States and the **Mountain Plover** *(Podasocys montanus)* of Western North America are two other members we have exhibited in our collection. Noteworthy are the **Cayenne Lapwings** *(Belonopterus chilensis)*, which are distinguished by their crests and the long orange wing-spurs, and the similar **European Lapwing** *(Vanellus vanellus)*.

The **Black**, or **Black-headed Turnstones** *(Arenaria melanocephala)* received their name from their habit of turning over shells and pebbles in search of insects and crustaceans. Common on our beaches of the Pacific Coast, they are rare in captivity. In its winter plumage, the head, neck and chest are sooty black without spots.

The godwits are characterized by a very long and slightly upward curved bill. The general color is reddish or brownish, but there is a great variation among individuals. The **Pacific Godwit** *(Limosa lapponica baueri)*, confined to the Pacific Coast, is exhibited here. We also exhibit the **Western Willets** *(Cataptrophorus semipalmatus inornatus)*, shy water birds with straight bills.

The **Long-billed Curlew** *(Numenius americanus)*, widely distributed through North America, is also shown. Its distinguishing mark is the long bill, strongly arched.

The gulls, so plentiful along our sea coasts and inland lake shores, are familiar to everyone. In the zoo, the gull population is a changing one; however, the following species have been represented. Among the local forms are such birds as **Heermann's Gull** *(Larus heermanni)*, the **Ring-billed Gull** *(Larus delawarensis)*, the **Herring Gull** *(Larus argentatus thayeri)*, the **California Gull** *(Larus californicus)*, and the **Western Gull** *(Larus occidentalis)*. **Franklin's Gull** *(Larus pipixcan)*, **Bonaparte's Gull** *(Larus philadelphia)*, and the **Laughing Gull** *(Larus*

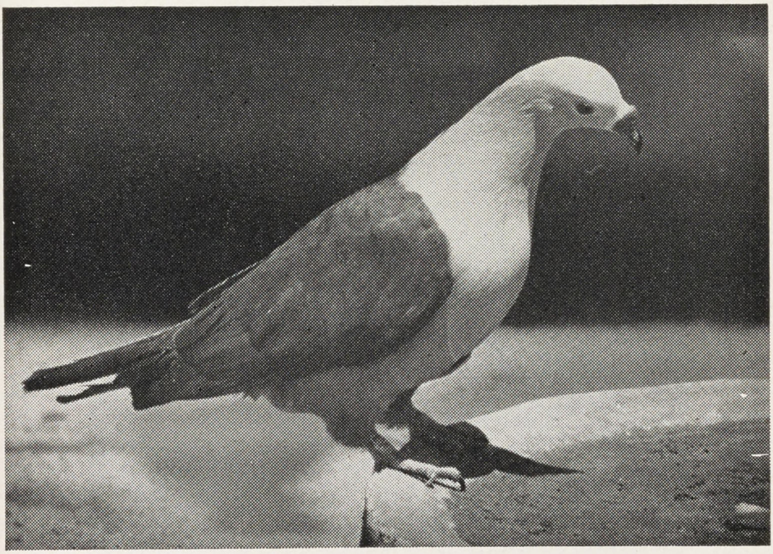


VICTORIA CROWNED PIGEON *(Goura v. victoria)* *atricilla)* are distinguished by their dark head plumage. The **Great Black-backed Gull** *(Larus marinus)* of the North Atlantic and the **Kelp Gull** *(Larus dominicanus)* of southern South America have dark gray mantles. Other foreign species have included the **Dusky Gull** *(Larus fuliginosus)* and the **Fork-tailed Gull** *(Creagus furcatus)* of the Galapagos Islands, and the lovely **Silver Gull** *(Larus novae-hollandiae)* of Australia and South Africa.

PIGEONS AND DOVES

This is one of the largest families in the entire group of birds. All the pigeons and doves may be distinguished from the poultry and the gallinaceous birds by the bill, arched toward the tip, and the convex swelling at the base.

The splendid crowned pigeons are indisputably the most conspicuous of all their tribe. Their great size and splendid crests render them striking objects, even at a distance. The **Victoria Crowned Pigeon** *(Goura v. victoria)* is found in the Jobi and Biak Islands. The **Argentine Spotted Pigeons** *(Columba maculos mainlosa)* and **Fiji Island Pigeons** *(Columba vitiensis)* are also exhibited. The **Nicobar Pigeon** *(Calœnas nicobarica)* is one of the hackled pigeons, and is found on the island of Nicobar and in New Guinea. The following pigeons have appeared in our collection: **Rufous Pigeon** *(Leptoptilia reichenbachi)*; the

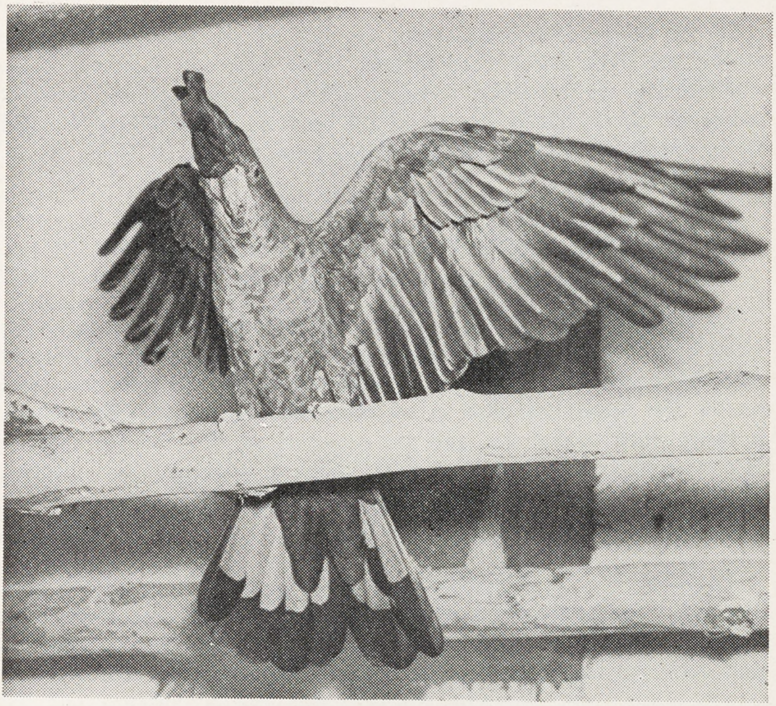


PACIFIC FRUIT PIGEON *(Ducula pacifica)*

Triangular-spotted Pigeon *(Columba guinea)*; the **Common Bronze-winged Pigeon** *(Phaps c. chalcoptera)*; the **Brush Bronze-winged Pigeon** *(Phaps elegans)*, and the **Australian Crested Pigeon** *(Ocyphaps lophotes)* from Australia; the **Imperial Fruit Pigeon** *(Ducula anea sylvatica)* from the Malay peninsula and India; the **Band-tailed Pigeon** *(Columba f. fasciata)* of the western United States; the **White-crowned Pigeon** *(Columba leucocephala)* ranging from Florida to the West Indies and along the coast of Central America. We show two species of the Bleeding Heart Pigeons; the **Luzon Bleeding Heart Pigeon** *(Gallicolumba luzonica)*, and the **Bartlett's Bleeding Heart Pigeon** *(Gallicolumba c. criniger)*, both from the Philippine Islands; and the **Goliath Pigeon** *(Ducula goliath)*.

The doves are usually smaller than the pigeons, but the general characteristics are the same. We usually exhibit the following foreign

KEA *(Nestor notabilis)*



BANKSIAN COCKATOO *(Calyptorhynchus magnificus)*

doves: the **Cape Dove** *(Oena capensis)*, the **Tambourine Dove** *(Tympanistria tympanistria)*, the **Emerald-spotted Dove** *(Chalcopelia chalcospilos)*, and the **Senegal Dove** *(Turtur senegalensis)* from Africa. The **Yellow-billed Ground Dove** *(Columbigallina cruziana)* and the **Yellow-eyed Ground Dove** *(Gymnopelia erychrothorax)* are from Peru. Amethyst Doves include the **Buff-headed Amethyst Dove** *(Phlogoenas xanthonura)*; the **Gray-hooded Amethyst Dove** *(Phlogoenas rubescens)*, and the **Black-fronted Amethyst Dove** *(Phlogoenas jobiensis)*. Others exhibited are the **Galapagos Ground Doves** *(Nesopelia galapagoensis)*; **Pearl-necked Doves** *(Spilopelia humilis)*; **Cassin's Dove** *(Leptotila cassini)*, and the **Martinican Dove** *(Zenaida aurita)*: the **Picui Dove** *(Columbina picui)* from Paraguay, and the **Blue-headed Quail Dove** *(Starnoenas cyanocephala)* from Cuba; the **Dwarf Turtle Dove** *(Streptopelia humilis)*; the **Green-winged Dove** *(Chalcophaps chrysochlora)*; the **Peaceful Dove** *(Geopelia placida)*; **Diamond Dove** *(Geopelia cuneata)*; **White-bellied Plumed Dove** *(Lophophaps plumifera)*; the **Copperneck** or **Bar-shouldered Dove** *(Geopelia humeralis)*; and the **Cloven-Feathered Dove** *(Drepanoptila holosericea)*.

Of the smaller North American members of the family, we usually exhibit the **Inca Dove** *(Scaradafella inca)* found in Arizona, Texas and Mexico; the **Mexican Ground Dove** *(Columbigallina passerina pallescens)* of the desert regions of the southwest; the **White-winged Dove** *(Melopelia asiatica)* which ranges from Central to South America as well as in Cuba.

LORIES, COCKATOOS, MACAWS, PARROTS, PARRAKEETS AND LOVEBIRDS

All the birds belonging to this large and splendid group can be recognized by the shape of their beaks, which are large, and have the upper mandible extensively curved and hanging far over the lower; in some species the upper mandible is of extraordinary length. The tongue is short, thick, and fleshy, and the structure of this member aids the bird in no slight degree in its singular powers of speaking. Our collection of Psittacine birds is one of the finest collections to be seen in the United States or in Europe.

The **Kea** *(Nestor notabilis)*, of the mountains of South Island, New Zealand, is among the most remarkable of parrots. A known meat-eater, it has gained the reputation of being a sheep-killer. Due to resulting persecution, it has become rare in the wild state.

Possessing the most brilliant colors in the entire order, the lories are for the most part small birds. The tongue is provided with a brush-like instead of fringed tip. In distribution, they are confined to the Australian region and to the adjacent, often small, islands. Their food consists largely of soft fruit, but they are also very fond of nectar, which their brushy tongues enable them to secure.

Twenty-three different forms of lory have been exhibited here at one time or another, among them: the **Black Lory** *(Chalcopsitta atra atra)*, the **Cardinal Lory** *(Chalcopsitta cardinalis)*, the **Blue-tailed Lory** *(Eos histrio histrio)*, **Edward's Lory** *(Trichoglossus haematod capistratus)*, the **Yellow-backed Lory** *(Domicella garrula flavopalliata)*, and **Kuhl's Ruffled Lory** *(Vini kuhlii)*.

The cockatoos are birds of large size, confined to Australasia, where they extend to the east as far as the Solomon Islands, north to the Philippines, and west as far as Celebes and Lombok. Their most marked external characteristic is the possession of a long frontal crest, which distinguishes them from all other Parrots with one or two exceptions.

Among the cockatoos which may be seen here are: the **Great Black Cockatoo** *(Probosciger aterrimus)*, the **Banksian** or **Red-tailed Black Cockatoo** *(Calyptorhynchus magnificus)*, the rare little **Gang-gang** *(Callocephalon fimbriatum)*, the **Greater Sulphur-crested Cockatoo** *(Kakatoe g. galerita)*, the **Citron-crested Cockatoo** *(Kakatoe sulphurea citrino-cristata)*, the **Umbrella-crested Cockatoo** *(Kakatoe alba)*, the **Molucca** or **Salmon-crested Cockatoo** *(Kakatoe moluccensis)*, **Leadbeater's Cockatoo** *(Kakatoe leadbeateri)*, **Ducorp's Cockatoo** *(Kakatoe ducorps)*, the **Bare-eyed Cockatoo** *(Kakatoe sanguinea)*, the **Slender-billed Cockatoo** *(Kakatoe tenuirostris)*, and the **Rose-breasted Cockatoo** or **Gallah** *(Kakatoe roseicapilla)*. Closely allied is the **Cockatiel** *(Nymphicus hollandicus)*, a small gray parrakeet which is widely distributed in Australia. It has a high crest like that of a cockatoo; hence, the name.

The macaws are mostly inhabitants of South America and Central America. They are splendid birds, and are remarkable for their great size, their very long tails, and the splendid hues of their plumage. The **Hyacinthine Macaw** *(Anadorhynchus hyacinthinus)* from the central provinces of Brazil, is the largest member of all parrots. It is deep blue in color, with bright yellow, naked skin at the base of the bill and around the eyes. The **Green-winged** or **Maroon Macaw** *(Ara chloroptera)*; the **Scarlet Macaw** *(Ara macao)*, found from Mexico to Bolivia; the **Blue and Yellow Macaw** *(Ara ararauna)*, from Guiana and the Amazon Valley; the **Military Macaw** *(Ara militaris)* are widely distributed and well known as pets. **Severe Macaws** *(Ara severa)*, and **Noble Macaws** *(Ara nobilis)* are small, green birds scarcely larger than Conures.

The conures from tropical America are small parrot-like birds with pointed tails, but feathered faces distinguish them from the Macaws. Ten species of Conures are found in our collection, the **Red-headed Conure** *(Aratinga rubra larvata)*; the **Red-fronted Conure** *(Aratinga wagleri)* of Porto Rico; the **Jendaya Conure** *(Eupsittula jandaya)*; the **Golden-headed Conure** *(Eupsittula aurea)*; **Petz's Conure** *(Eupsittula canicularis)*; the **Brown-throated Conure** *(Eupsittula pertinax aeruginosa)*; the **Black-headed Nanday Conure** *(Conurus nandayas)*; **White-eared Conure** *(Pyrrhura leucotis)*, inhabitants of Brazil and seldom exhibited. Several young of this species inhabit the cage with the original four. The **Thick-billed Parrot** *(Rhynchopsitta pachyrhyncha)* of Arizona and Mexico is the only parrot which now occurs within the United States.

Over one hundred species of Amazons are known. These are mainly green plumaged parrots whose main characteristic is the possession of a short and broad, rather round tail, about half the length of the wing. They have moderately strong bills and a swollen naked cere. Several species of these American parrots are exhibited in our collection as follows: The **Yellow-naped Amazon** *(Amazona auropalliata)*, one of the most popular cage birds; the **Mealy Amazon** *(Amazona farinosa)*; **Finsch's Amazon** *(Amazona finschi)*; the **Orange-winged** (flanked) **Amazon** *(Amazona amazona)*; the **Yellow-fronted Amazon** *(Chrysotis ochrocephala)*; the **Blue-fronted Amazon** *(Amazona æstiva)* the **Double Yellow-head** (Levaillants) **Amazon** *(Amazona oratrix)*; the **Single Yellow-headed Amazon** *(Amazona panamensis)*; the **San Domingan** (Salle's) **Amazon** *(Amazona ventralis)*; the **Spectacled** (White-browed) **Amazon** *(Amazona albifrons)*; and the **Green-cheeked Amazon** *(Amazona viridigena)*.

Rare parrots exhibited here have included: the **Great Vasa Parrot** *(Coracopsis vasa)*, found in Madagascar; the **Great-billed Parrot** *(Tanygnathus megalorhyncus)* with its large bright coral bill; **Muller's Parrot** *(Tanygnathus sumatranus)*; the **Red-vented Parrot** *(Pionus menstruus)*; the **Bronze-winged Parrot** *(Pionus chalcopterus)*; the rare **Racket-tailed Parrot** *(Prioniturus platurus)*; the **Senegal Parrot** *(Pœocephalus senegalus)* from Gambia, western Africa; and the **Vulture-headed Parrot** *(Psittrichus fulgidus)* from New Guinea.

The eclectus parrots are remarkable for their brilliant coloration. The males are grass green with red sides. Three kinds are exhibited in our collection. The females are scarlet with blue on the sides. **Cornelia's Eclectus Parrot** *(Lorius roratus cornelia)* is found in the interior of Sumba and the Moluccas, and the **Red-sided Eclectus Parrot** *(L. r. pectoralis)* is from the Papua Islands. The latter has been raised here. The **Solomon Eclectus** *(L. r. solomensis)* has also been exhibited.

The caiques are short, stout parrots with very unusual color patterns. They are comical in their actions and are notorious for their fighting ability and aggressiveness. Usually we exhibit the **Black-headed Caique** *(Pionites m. melanocephala)*; the **White-breasted Caique** *(Pionites l. leucogaster)*; and several **Hawk-headed Caiques** or **Fan Parrots** *(Deroptyus a. accipitrinus)* ranging from Ecuador to the Amazons, probably most abundant in northeastern Brazil.

Sometimes represented in the collection is the **Gray-breasted** or **Quaker Parrakeet** *(Myiopsitta monachus monachus)*, one of the most interesting members of the parrot family. It is the only one known to build a nest, made up of twigs and sticks. Usually most parrots lay their eggs in hollow trees, making no nest at all. We also exhibit the **Tovi Parrakeets** *(Brotogerys jugularis)*, the best known members of a small group of green parrakeets; the seldom imported **Orange-flanked Parrakeet** *(Brotogerys pyrropterus)* from western Ecuador and northwestern Peru; the **Peruvian Green Parrakeet** *(Psittacula coelestis coelestis)*, and the **Lineolated Parrakeet** *(Bolborhyncus lineolatus)*. Among larger parrakeets are the **Blossom-headed**

Parrakeet *(Psittacula c. cyanocephala)*, the male having the head purplish, edged with pink; **Bengal Ring-neck Parrakeets** *(Psittacula torquata)* with a rose-red collar encircling the neck excepting in front; The **Indian Hill Parrakeet** *(Psittacula eupatria nipalensis)* is a size larger with much the same color scheme but richer in its coloration—young have been raised here. The **Banded** or **Moustached Parrakeet** *(Psittacula fasciata)* has been freely imported and it is one of the most popular parrakeets and the Chinese **Derbyan** *(Psittacula derbyana)* is one of the handsomest.

Australia is well represented with a fine group of parrakeets which may include the following: the **Barraband** *(Polytelis swainsonii)*, the **Rock Peplar** *(Polytelis anthopeplus)*, **Queen Alexandra's Parrakeet** *(Polytelis alexandrae)*, the **Crimson-wing** *(Aprosmictus erythropterus)*, the **King Parrakeet** *(Alisterus scapularis)*, **Pennant's Rosella** *(Platycercus elegans elegans)*, the **Eastern Rosella** *(Platycercus eximus eximus)*, the **Western Rosella** *(Platycercus icterotis icterotis)*, the **Pale-headed Rosella** *(Platycercus adscitus palliceps)*, **Brown's Rosella** *(Platycercus venustus)*, **Barnard's Parrakeet** *(Platycercus zonarius barnardi)*, the **Yellow-banded Parrakeet** *(Platycercus zonarius semitorquatus)*, the **Pileated Parrakeet** *(Purpureicephalus spurius)*, the **Blue Bonnet** *(Northiella haematogaster)*, the **Red-rump**

ROAD-RUNNER *(Geococcyx californianus)*

(Psephotus haematonotus), the **Hooded Parrakeet** *(Psephotus chrysopterygius dissimilis)*, the **Blue-winged Grass Parrakeet** *(Neophema chrysostomus)*, the **Scarlet-chested Parrakeet** *(Neophema splendida)*, and the familiar **Budgerigar** or **Shell Parrakeet** *(Melopsittacus undulatus)*.

Those who have visited aviaries are doubtless familiar with the pretty little lovebirds, which are so-called for the affection which the sexes seem to show for each other. One of the best-known species is the handsome **Peach-faced Lovebird** *(Agapornis roseicollis)* of southwestern Africa. The general color of lovebirds is green, with the face and neck varying in color. Others in the collection are the **Abyssinian Lovebird** *(Agapornis t. taranta)*; the **Nyasa Lovebird** *(Agapornis lilianæ)*; the **Masked Lovebird** *(Agapornis personata)*, and the **Gray-headed Lovebird** *(Agapornis c. cana)*, which seems to be shorter-lived in captivity than some of the others.

CUCKOOS

The ground cuckoos are birds of rather dull plumage and have powerful legs and feet, adapting them for life on the ground. They have short, rather weak wings. The tail is long in most species. One of the best known members of this group is the **Road-runner** or **Chaparral Cock** *(Geococcyx californianus)* of the southwestern United States and northern Mexico. This bird runs with astonishing speed when scared or chased.

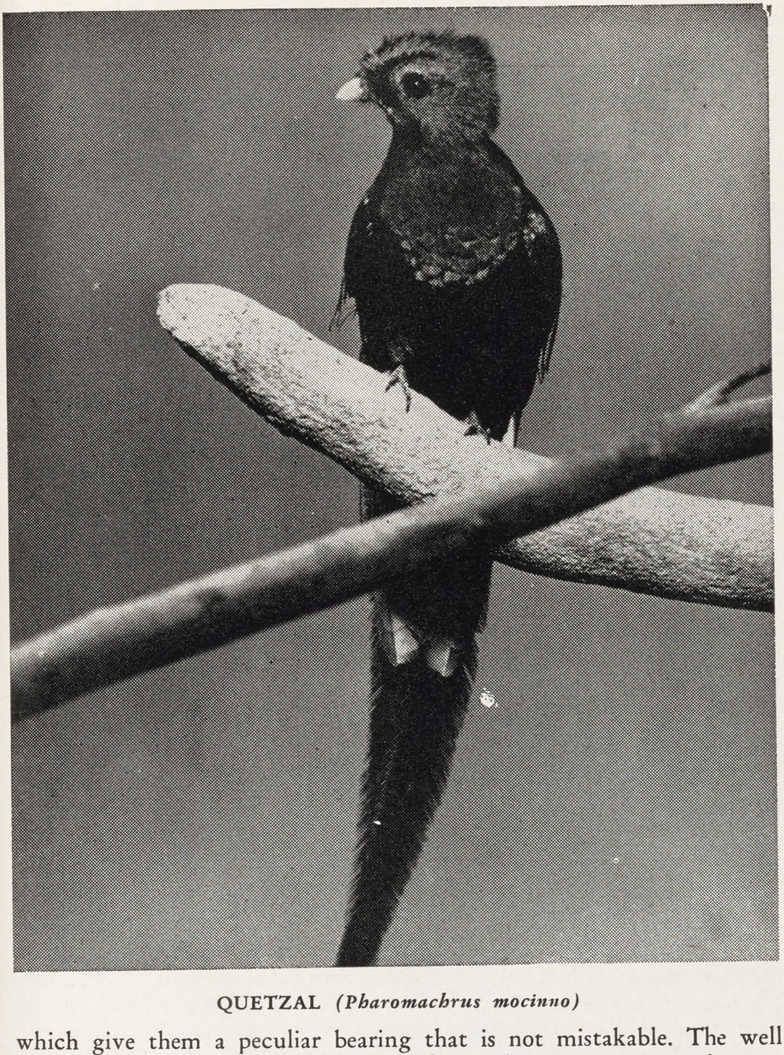
Closely related to the cuckoo family is that of the touracos, which are found only in Africa. Best known of the family are the green touracos which are forest birds. Their body plumage is dull green while their wings are deep red. The wing feathers contain a water soluble pigment known as turacin. Two forms are usually to be seen here: **Donaldson's Touraco** *(Tauraco leucotis donaldsoni)* and **Hartlaub's Touraco** *(Tauraco hartlaubi)*, both of East Africa.

TROGONS

The Trogons are to be included in any list of the world's most beautiful birds. They are for the most part jungle dwellers which inhabit the New and Old World tropics. All species are noted for their brilliant plumage, but the **Quetzal** *(Pharomachrus mocinno)* of Southern Mexico and Central America is easily the most spectacular member of its clan. The male of this species is distinguished by streaming, coppery-green "tail" plumes. The **Eared Trogon** *(Euptilotis neoxenus)* of the mountains of Mexico is closely related but lacks the long plumes. The **Cuban Trogon** *(Priotelus temnurus)* is a small species with a green back, purplish head, gray breast, and a red vent and bill.

KINGFISHERS, MOTMOTS, ROLLERS AND HORNBILLS

The Kingfishers form a well-marked group, all of them being remarkable for their long bills and the comparative shortness of their bodies,



QUETZAL *(Pharomachrus mocinno)*

which give them a peculiar bearing that is not mistakable. The well known **Belted Kingfisher** *(Megacerle a. alcyon)* is commonly seen all along the Pacific Coast and in the bay regions. Curiously, the fish-catching kingfishers do not do well in captivity, so very few are ever exhibited. The **Giant Kingfisher** or **Laughing Jackass** *(Dacelo gigas)* is the national bird of Australia, being found chiefly in the southeastern district of that country and in New South Wales.

The Motmots are a small group of handsome birds with much of green, blue, cinnamon, and black in their loose-webbed plumage, and usually live in dense forests. These birds are found exclusively in the New World. The bill, which is crow-like in appearance, is provided with saw-like notches which are razor sharp and are probably used in holding small rodents, which they eat. In most forms the central tail feathers are much longer than the others and terminate in racket-shaped tips. The species represented in our collection is **Lesson's Motmot** *(Momotus momota lessonii)*, found in Central America.

Hornbills stand high among Nature's more grotesque creations. Their enormous bills, which in some species support large casques or helmets, their conspicuous eye-lashes, and their large size all contribute to a spectacular appearance. Their bills and casques are not as heavy as they look, having a light "honeycomb" internal structure. Hornbills inhabit the forests of the warmer parts of the Old World from Africa, through southern Asia and the East Indies to the New Guinea region.

One of the largest is the **Concave-casqued Hornbill** *(Buceros bicornis)* of India and Malaya. The species has nested (although unproductively) in the zoo, exhibiting the nest-plastering technique for which hornbills are noted. The female enters a hole in a hollow tree and with the help of the male walls up the nest opening with excrement and mud except for a small aperture just large enough to permit the male to feed her. Throughout the incubation period and the infancy of the chicks, the female is safe from predators. When the young are old enough to fly, they and the mother emerge from the nest. Other species of tree-dwelling hornbills which have been exhibited here include the **Philippine Rufous Hornbill** *(Buceros hydrocorax)*, the **African Red-billed Hornbill** *(Tockus erythrorhynchus)*, the **Wreathed Hornbill** *(Aceros undulatus)* of the Malay Peninsula and the East Indies and the **Papuan Hornbill** *(Aceros plicatus mendanae)* which occurs from the Moluccas to the Solomons. The African ground hornbills are large terrestrial birds with black and white plumage and black bills and casques. The **North African Ground Hornbill** *(Bucorvus abyssinicus)* has been shown here.

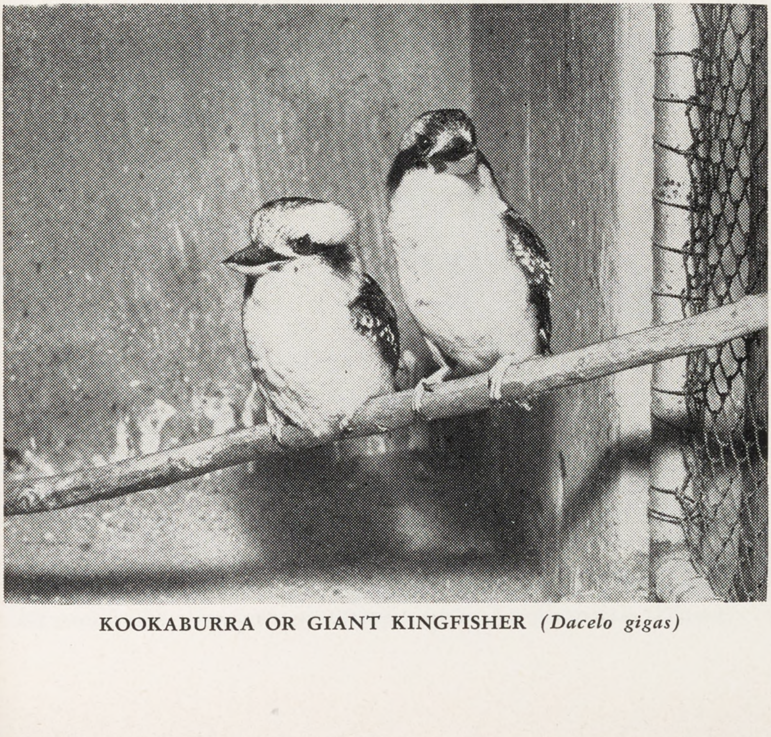
The Rollers are medium-sized, insectivorous birds which inhabit the warmer regions of Africa, southern Europe, and Asia. The **Indo-Chinese Blackbilled Roller** *(Coracias benghalensis affinis)* is the species which has been shown here.

BARBETS, TOUCANS AND WOODPECKERS

The birds of this group differ greatly from each other in general appearance, but they are joined together by common characteristics, the most important of which is that the toes (two directed forward and two backward) are moved by an arrangement of muscles found in no other bird.

The **Blue-cheeked Barbet** *(Cyanops asiatica)* comes from India. The barbet takes its name from the French, signifying a sort of beard. This is due to the presence of numerous strong bristles about the base of the bill. It is stockily built with a large head and stout bill. The general color is bright green, with the head blue and the crown red. A spot of scarlet appears on each side of the throat. The **Toucan Barbet** *(Semnornis rhamphastinus)* of Ecuador and Peru has also been exhibited.

The curious birds that go by the name of Toucans are no less remarkable than the hornbills, their beaks being as large in some species, and their colors are far superior. They are confined to the New World, and are distributed more or less abundantly over the wooded districts from southern Mexico to northern Argentina. Toucans are most numerous in the great forest regions of the Amazon. The large, painted bills, resembling the claws of a lobster, and the long fringed tongues lying the entire length of the beak are probably well known to everyone interested in birds. The huge beak is very light in weight in comparison to its size. The outer wall of the bill is said to be one-thirtieth of an inch in thickness. In captivity these birds live well on fresh fruits. They are fed grapes, bananas, apples, pears, soaked raisins, oranges, insects, hard-boiled eggs, occasionally a mouse, and bread and milk. They have lettuce as a green food. The plumage is brilliant, the black



KOOKABURRA OR GIANT KINGFISHER *(Dacelo gigas)* or green bodies being ornamented with red, orange, white and blue.

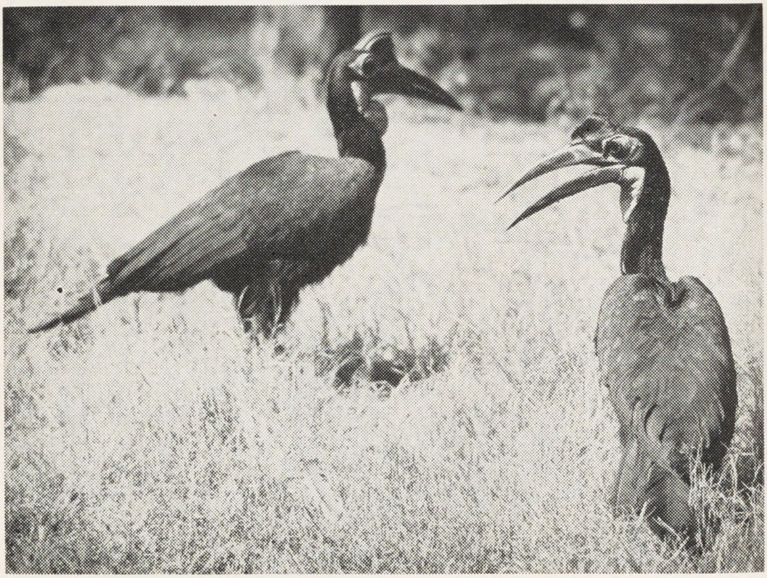
Among the species to be seen here from time to time are: The **Toco Toucan** *(Ramphastos toco)*; the **Swainson's Toucan** *(Ramphastos swainsonii)*; the **Ariel Toucan** *(Ramphastos ariel)*; the **Wagler's Toucan** *(Ramphastos ambiguus)*; the **Red-billed Toucan** *(Ramphastos monilis)*; the **Short-keeled Toucan** *(Ramphastos brevicarinatus)*; and the **Emerald Toucanet** *(Aulacorhynchus prasinus)*.

PERCHING BIRDS

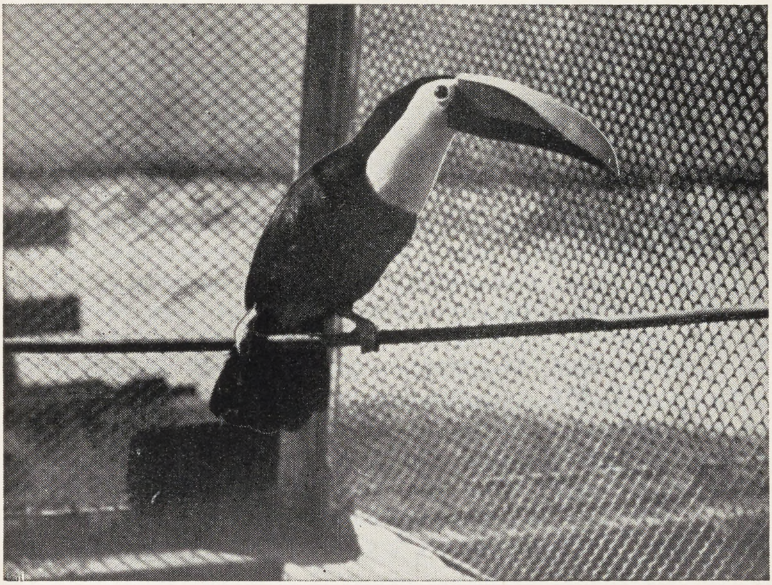
The birds in this group form the largest order of related birds. Nearly one-half of the known birds of the world are found in this order, so every collection of birds includes many of its members. Nearly two hundred species are represented in our collection, so that it is impossible to consider all of them here.

The lovely **Scarlet Cock of the Rock** *(Rupicola peruviana sanguinolenta)* from western Colombia is one of the rarest and most brilliantly colored birds exhibited. The plumage is deep scarlet in color with a saddle of gray feathers on the back. The crest is large and bushy in appearance. The **Apricot Cock of the Rock** *(R. p. aequatorialis)* of Ecuador and Peru is similar but paler in color.

The **Orange Cock of the Rock** *(Rupicola rupicola)* from northeastern South America with its half-moon, fanlike crest has also been shown. The feathers on the back are delicately curled or wavy in



NORTH AFRICAN GROUND HORNBILL *(Bucorvus abyssinicus)*



SWAINSON'S TOUCAN *(Ramphastos swainsonii)*

appearance, giving an ornamental effect to the whole plumage. The **Bare-throated Bellbird** *(Procnias nudicollis)* a native of southeastern Brazil, is so named for its loud resonant notes which resemble a clear ringing bell. The plumage is snow white throughout. The space around the eyes and the throat is covered with a naked skin, invested sparingly with minute black feathers, which become grass green in the breeding season.

The Fairy Bluebirds are considered to be among the most beautiful of all the perching birds. The male of the **Malayan Fairy Bluebird** *(Irena puella cyanea)* has the upper parts a bright blue with the breast and abdomen of coal black. Each feather appears to have been enameled, adding much to the gorgeous shades.

The Crows and Jays *(Corvidae)* from a large family, containing crows, rooks, magpies, starlings, and other familiar birds, together with the bower birds and less known paradise birds, troupials, and orioles. The beak of all these birds is long, powerful, and somewhat compressed or flattened at the sides. It is curved on the ridge of the upper mandible and has a notch at the extremity.

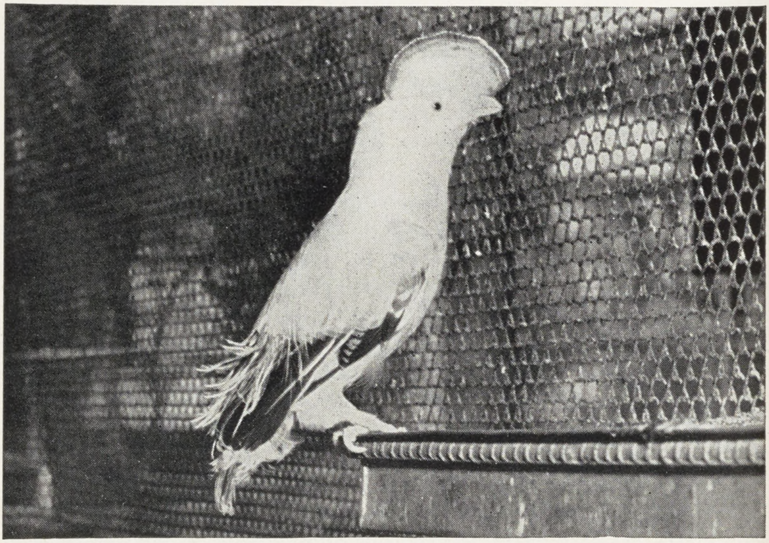
The **Blue Kitta** *(Kitta chinensis thalassina)* of Java is very similar to the Chinese Hunting Crow. The plummage is a turquoise blue in color with the wing primaries a pleasing shade of brown. The beak is vermilion in color. The black velvety ring encircling the eyes enhances the beauty of this bird.

The **Western Raven** *(Corvus corax sinuatus)* of the western United States and Mexico, and the Magpies, too, are members of this family: the rare **Formosa Blue Magpie** or **Tree Pie** *(Urocissa caerulea)* with its coral red beak, and the **Red-billed Tree Pie** *(Urocissa erythrorhyncha)* of southeastern Asia.

Among the jays which enliven the small bird house are the familiar **California Jay** *(Aphelocoma c. californica)*, the **Eastern Jay** *(Cyanocitta cristata)*, the **Canada Jay** *(Perisoreus c. canadensis)* and the **Talamanca Jay** *(Cyanocorax affinis zeledoni)* of Central America, and the **Mexican Green Jay** *(Xanthoura yncas luxosa)*. **Clark's Nutcracker** *(Nucifraga columbiana)* is related to the jays and crows.

The Birds of Paradise are among the most spectacular birds in the world, both because of their beautiful plumage and because of their remarkable courting displays. The **Paradise Rifle-bird** *(Ptiloris paradiseus)* of Australia, the **Lesser Bird of Paradise** *(Paradisea minor)* and the **Six-plumed Bird of Paradise** *(Parotia lawesi)* are among those which have been exhibited here.

The Bower-birds, sometimes united in a single family with the Birds of Paradise, make up for any lack of brilliant plumage by



ORANGE COCK OF THE ROCK *(Rupicola rupicola)* their peculiar habits of courtship. For this purpose the bower is constructed from twigs in a manner almost unique among birds. After building this curious bower, the bird does not use it as a nest but as a place or resort for courting a mate, and these bowers are deserted afterward. The **Satin Bower-bird** *(Ptilinorhynchus violaceus)*, the black and gold **Regent Bird** *(Sericulus chrysocephalus)*, and the **Green Catbird** *(Ailuroedus crassirostris)*, which inhabit eastern Australia, are all members of this group.

The Babbling-thrushes are well represented throughout Asia and Africa. The following forms are usually on exhibit in the small bird house: the **Himalayan Jay-thrush** *(Garrulax leucolophus)*, the **White-throated Jay-thrush** *(Garrulax albogularis)*, the **Black-Gorgeted Jay-thrush** *(Garrulax pectoralis)*, the **Masked Jay-thrush** *(Garrulax perspicillatus)*, the **Spectacled Laughing Thrush** *(Trochalopteron canorum)*, the **Streaked Laughing Thrush** *(Trochalopteron lineatum)* and the **Silver-eared Hilltit** *(Mesia argentauris)*, all of Asia.

The Bulbuls are also found both in Asia and Africa. The **White-eared Bulbul** *(Molpastes leucogenys leucotis)* and the **Red-eared Bulbul** *(Otocompsa emeria)* have been exhibited here.

The Mockingbirds are well known as wonderful songsters and not only possess a very fine and melodious voice, but are also endowed with the capacity for imitating the notes of any other bird. They are rather a small family, confined entirely to the New World. Two species of the Galapagos Mockingbirds, the **Galapagos Mockingbird** *(Nesomimus barringtonii)* of Barrington Island, and the **Galapagos Mockingbird** *(Nesomimus baurii)* of Tower Island have been exhibited in our collection. The bill is thrasher-like with the tip decidedly curved.

The **Indian Dhyal-bird** *(Copsychus s. saularis)* or Magpie-Robin found from India to Burma and China, is a beautiful black and white little Asiatic thrush closely allied to the European Robin and has been exhibited in our collection. The song is typically thrush-like and is very melodious. Other thrushes which have been shown here include: the **European Blackbird** *(Turdus merula)*, the **Fieldfare** *(Turdus pilaris)*, also of Europe, the **Nightingale Thrush** *(Catharus melpomene costaricensis)* of Costa Rica, and the **Red-legged Thrush** *(Mimocichla rubriceps)* of Cuba.

The Waxwings *(Bombycillidæ)* are a small family belonging to the larger group of singing birds. The plumage is soft and silky and the red waxy tips on the secondaries of the wing feathers give this bird its name. They are always immaculate in appearance. The **Cedar Waxwing** *(Bombycilla cedrorum)* of North America and the **Bohemian Waxwing** *(Bombycilla garrula)*, recently imported do well as cage birds.

The Starlings and Mynahs *(Sturnidæ)* are widely distributed over the Old World, having their center of abundance in the Indian and Ethiopian regions. Fruits and insects seem to make up their diet. The **Pagodah Starling** *(Temenchus pagodarum)* comes from Afghanistan, Ceylon and India. The Hill Mynahs are glossy black birds with yellow wattles on the sides of the head. These birds are popular as cage birds for their ability to learn to talk. Their voices are well modulated and very like human voices. Their mimical talent cannot be imitated by any other bird excepting the Grey African Parrot. Three species are represented in our collection. The largest of these glossy black mynahs is the **Javan Hill Mynah** *(Eulabes javanensis)*; the **Greater Hill Mynah** *(Eulabes intermedius)* from Assam, and the **Southern Hill Mynah** *(Eulabes religiosa)* in southern India. Most unusual of the Mynahs which have been exhibited here is the lovely **White Mynah** *(Leucospar rothschildi)* of Bali. The **Paradise Starling** *(Cosmopsarus regius)* and the **Blue-eared Glossy Starling** *(Lamprocolius chalybeus)*, both of Africa, the **Philippine Coleto** *(Sarcops calvus)*, and the **Black-winged Starling** *(Sturnus m. melanopterus)* of Java have also been represented in the collection.

The Sugar-birds or Honey-creepers *(Cœrebidæ)* are small birds of the American tropics. They resemble humming birds with long curved bills and the combination of bright greens, blues, and reds. The food includes the nectar of flowers, as well as insects and soft fruits. The **Yellow-winged Sugar-bird** *(Cyanerpes cyaneus cyaneus)* from Panama and the **Blue Sugar-bird** *(Dacnis cyana)* are usually to be seen in our collection of small birds.

The family of Orioles *(Icteridæ)* includes, besides these well known birds, a number of others, such as the Blackbirds, the Grackles, and the Cassiques. All have a sharp pointed bill and are medium sized birds. This group is exclusively American and a majority of the nearly one hundred and fifty species are of tropical distribution. Orioles in our collection are: **Sclater's Oriole** *(Icterus sclaterii)*; **Nelson's Oriole** *(Icterus cucullatus nelsoni)*; and the **Yellow-crowned Oriole** *(Icterus chrysocephalus)*. The Troupials are very closely related to the Orioles. The **Common Troupial** or **"Bugle Bird"** *(Icterus vulgaris)* is well known, with its deep orange and black plumage. The **Black Troupial** *(Quiscalis lugibris)* is another representative of this family; one of the **Marsh Troupials** or **Military Troupials** *(Trupiales militaris)* with its beautiful red breast. The **San Diego Red-winged Blackbird** *(Agelaius phœniceus neutralis)* of the western United States, and the **Dwarf Cowbird** *(Molothrus ater obscurus)* found in Mexico, Lower California, and the adjacent parts of the United States, are also in this group. The Cassiques are hangnest building birds, with a plumage of mixed black and scarlet, orange, or yellow, or in some plain black. Some of these birds have the head conspicuously crested. They inhabit the deep forests of the tropics and build wonderful pensile nests sometimes three to four feet in length. These are attached to the slender branches of mimosa, acacia, and other trees, sometimes as many as six or seven in the same tree. Several species are always seen in our collection. The **Mexican Cassique** *(Cassiculus melanicterus)* of western Mexico is black and lemon-yellow in color. The **Crested Cassique** *(Ostinops decumanus)* ranges from Panama to southern Brazil and Bolivia and is one of the largest members of this group. The **Yellow Cassique** *(Cassicus persicus)* is also found in South America from Colombia to Bolivia and southern Brazil.

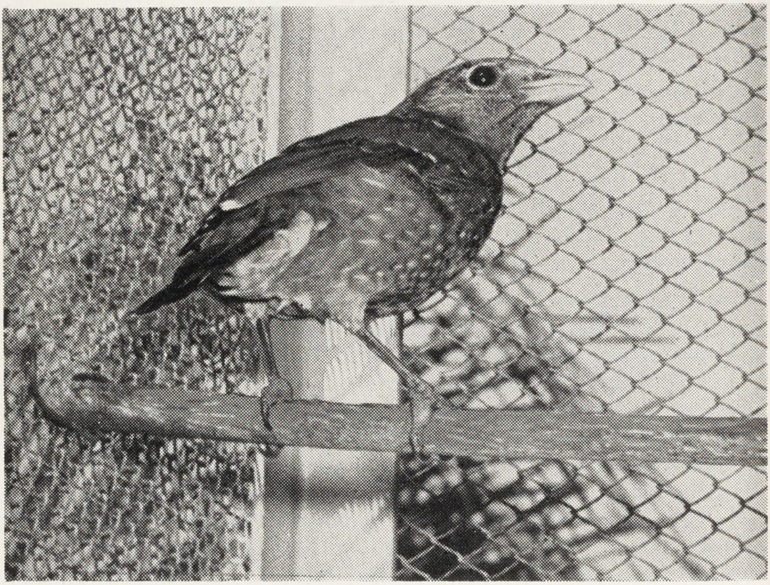
The Weavers, Whydahs, Mannikins and Waxbills *(Ploceidæ)* form a large family of small brightly colored birds of Old World distribution. Living almost entirely on seeds, these birds are easily kept in aviaries. From Africa we exhibit the **Orange Weaver** *(Pyromelana franciscana)*; the **Blood-bill** or **Red-bill Weaver** *(Quelea quelea)*; and the following Whydahs, with long tails during mating season: the **Paradise Whydah** *(Diatropura progne)*; the **Pintail Whydah** *(Vidua principalis)*. The Mannikins are small, stout-bodied birds with rather thick bills. Representative forms are the **Three-colored Mannikin** *(Munia malacca malacca)*; **White-headed Mannikin** *(Munia m. maja)*; **Brown-headed Mannikin** *(Munia brunneiceps)*; **Black-headed Mannikin** *(Munia atricapilla)*; **Spice Finch** *(Munia punctulata)*. Closely related are the popular Gray and White **Java Sparrows** *(Padda oryzivora)*. Among the beautiful small birds is the **Gouldian Finch** *(Poephila gouldiæ)* of Australia, with greens, reds, purples, yellows and blacks mixed harmoniously together. The tiny Waxbills with small red waxlike bills are all from Africa. We will mention only a few of the most attractive of these: The **Golden-breasted Waxbill** *(Sporaeginthus subflavus)*; **Crimson-faced Waxbill** *(Pytilia m. melba)*; **St. Helena Waxbill** *(Estrilda astrilda)*; **Cordon Bleu** or **Crimson-eared Waxbill** *(Uræginthus b. bengalus)*.

The Tanagers *(Thraupidæ)* are the New World birds, another large family of brightly colored birds from the tropics. Our collection of birds contains many from this family. They live almost entirely on fruits and berries with some insectivorous food. The **Silver-beaked Tanager** *(Rhamphocelus b. brasilius)* similar to our native Scarlet Tanager, retains its bright red and black colors throughout the year; the **Maroon Tanager** *(Rhamphocelus jacapa)*; **Silver-Blue Tanager** *(Tanagra cana)*; **Yellow-rumped Tanager** *(Rhamphocelus icteronotus)*; **Blue and Black Tanager** *(Tanagrella cyanomelaena)*; **Black Tanager** *(Tachyphonus rufus)*; **Magpie-Tanager** *(Cissopis leveriana)*; **Superb Tanager** *(Calliste fatuosa)*; **Violet Tanager** or **Organist Tanager** *(Tanagra v. violacea)*.

The Finches *(Fringillidæ)*, abundant and of wide distribution, are well known small and medium sized birds with a strong, hard, cone-shaped bill which is adapted in most cases for shelling and eating the various seeds that form the chief portion of their food when adult. So many species are exhibited only a few may be mentioned here. The Goldfinches and Siskins are represented by the **European Goldfinch** *(Carduelis carduelis)* throughout Europe and the **Hooded Siskin** *(Chrysomitris cucullata)*, bright orange with a black head, from Venezuela.

The golden-yellow **Saffron Finch** *(Sycalis flaveola)*; the **Pileated Finch** *(Coryphospingus pileatus)*; the little **Melodious Cuban Finch** *(Phonipara canora)*; the cardinals and grosbeaks; the juncos; the canaries (both wild and domesticated); and the towhees are but a few of the diverse types of birds which are encompassed by this enormous family.

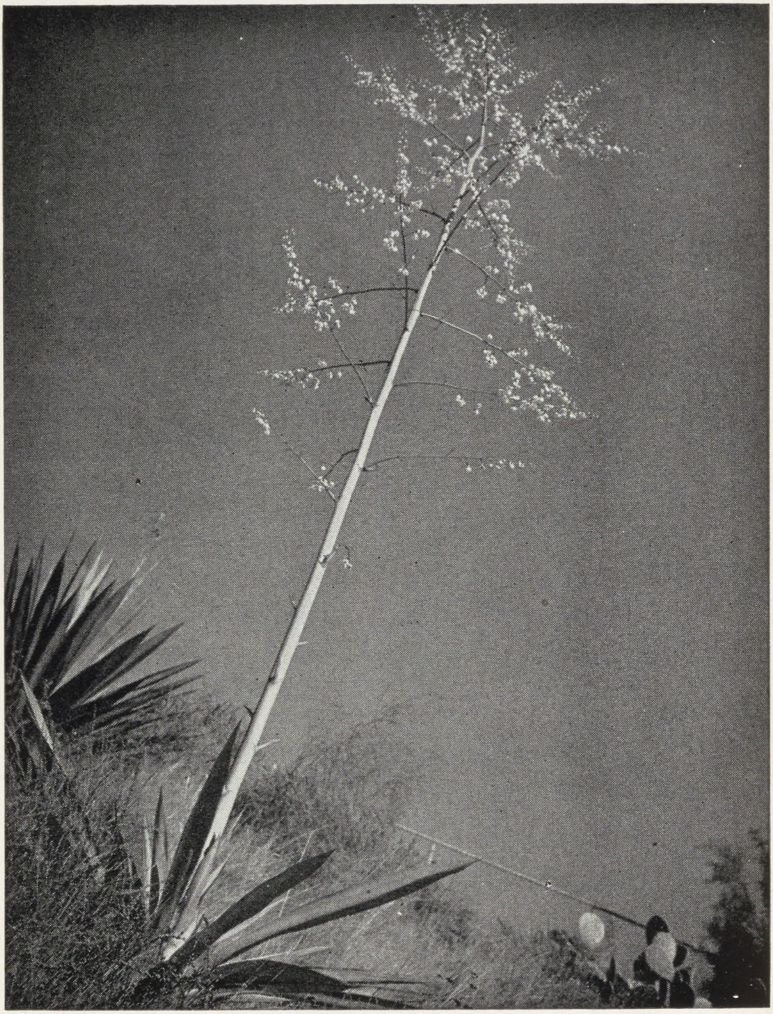
Two of the most beautiful of the smaller American finches exhibited are the **Painted Bunting** *(Passerina ciris)* found in the southern states, and the **Indigo Bunting** *(Passerina cyanea)* of the eastern United States.



GREEN CATBIRD *(Ailuroedus crassirostris)*

HIBISCUS (*Hibiscus* sp.)

Plant Section



MEXICAN YUCCA *(Yucca elephantipes)* in bloom.

INTRODUCTION TO PLANT SECTION

The Zoological Society of San Diego has been motivated by two ideas in laying out and landscaping the Zoological Garden. The first natural desire was to develop the section of Balboa Park for which it was responsible with the planting in harmony and of a quality comparable to the other cultivated areas of our world-famous park. The second was to create a setting for the collection of animals as suitable to their characters and backgrounds as possible. This was our conception of the Zoological Garden. Less clearly defined motives were to provide browse, fruits, and fodder for the animals, and to give them shade and natural shelter for their characteristic requirements. We felt that since the animals themselves came from all corners of the earth so should our shrubbery, trees and grasses. We have not confined our efforts therefore to importing tropical plants only, although as the greater number of our animated exhibits originate in tropical or sub-tropical zones, so do the majority of our botanical specimens.

Most people who are interested in zoos are also interested in trees and flowers, and the staff at the zoo has come to consider plant specimens an important part of our exhibit. The trees and shrubs have been marked by signs, placed on prominent specimens of each species, especially in those areas where pedestrians spend the greater part of their time along the walks and near enclosures. Placing of name plaques on shrubs and trees has eliminated thousands of questions. Like the animal signs the plant name plates carry the scientific and common names, place of origin and other interesting information.

The following guide book section has been provided in order to supplement the data offered by plant identification signs. No attempt has been made here to describe or even to list every species of plant in the grounds. The species treated here are those in which zoo visitors have indicated the greatest interest. Information contained in the guide book on the plant desired can be found easily by referring to the index to the plant section. Since many of the exotic shrubs have no common names in English, scientific names have been used.

The material in this section has been compiled by Karl Baker.

PALM TREES

For simplicity the palms have been divided into two groups according to the shape of the leaves. The feather leaf palms have one main leaf stem from which the leaflets extend in a feather-like fashion on each side. In the fan leaf palms the leaflets all originate at the end of the leaf stem at one point. The most common of the feather palms on the grounds are the **Queen Palm** *(Arecastrum romanzoffianum)* and the Canary Island Date Palm. The Queen Palm, a native of Brazil, is distinguished by its feather leaves with the leaflets extending from the leaf stem with no definite regularity. This palm is used as extensively in San Diego as is the Royal Palm in more tropical areas and certainly equals the more delicate species in beauty.

The **Canary Island Date Palm** *(Phoenix canarensis)* is a member of the genus *Phoenix* which is distinguished by the leaflets forming spines at the base of the leaf stem or petiole. This is the most numerous palm on the grounds. A native of the Canary Islands, it is the hardiest as well as being one of the most satisfactory and widely cultivated of the palms. It is well suited for street, park, and lawn plantings. The dates, while edible, are of no commercial value.

The **Pigmy Date** *(Phoenix roebelenii)* of Southeast Asia is a dwarf species with fernlike foliage and one that is especially suited for pot and tub culture. The specimens here are doing well. They must be hunted to be seen because they are almost completely hidden by sheltering plants.

The **Senegal Date Palm** *(Phoenix reclinata)* is one of the best known of the African palms. As a young plant it is used a great deal as a house or conservatory plant but unless suckers are removed the tree forms a dense clump desirable only in large spaces.

We have two species of palms native to Lord Howe's Island that are well known throughout the world because they are used for indoor ornamentals. They are the **Curley Palm** *(Howea belmoreana)* and the **Thatch Leaf Palm** *(Howea forsteriana)*, which differs from the first in that the leaves do not arch so much and the leaflets are not nearly so crowded.

The **Piccabeen Palm** *(Archontophoenix cunninghamii)*, a semi-tropical palm of Australia, considered the handsomest of the genus, is also well adapted to pot and lawn culture in this climate.

The **Pindo Palm** *(Butia capitata)* of Brazil is dwarf in growth compared to many of the above species but very hardy. The leaf stem is arched and spiny at the base. The fruits are edible, having a pleasant pineapple flavor. It is widely planted throughout the grounds, especially in the area of the Reptile mesa and the Big mammal mesa. The fruits are eagerly eaten by all of the primate group.

The **Bamboo Palm** *(Chamaedorea* sp.) of the American tropics is well named. Its long, slender trunks are very similar to stalks of bamboo. This species is very sensitive to frosts.

Most of the fan palms on the grounds fall into two genera, *Washingtonia* and *Chamaerops*. The **California Fan Palm** *(Washingtonia filifera)* is native to the springs and streams along the borders of the Colorado Desert in California and Arizona where it attains the height of eighty feet. It has been extensively planted in Central and Southern California as well as along the Gulf Coast and in Florida. In nature this tree is clothed with a dense, evenly thatched "petticoat" or shag of old, hanging leaves.

The **Mexican Fan Palm** *(Washingtonia robusta)* is much more suited for planting along the coast than is the California Fan Palm. Its origin is not definitely known although it is accredited by most authorities to Mexico. The shag of leaves fall from the tall trees leaving the trunk bare with a compact head of green fan leaves at the top.

In addition to these two species we have examples of the only palm native to Europe, the **Hair Palm** *(Chamaerops humilis)* from the Mediterranean region. It is very popular where small, hardy species are required. Another very similar palm is the **Windmill Palm** *(Trachycarpus excelsus)* of Asia which differs mainly in having small teeth on the leaf stems rather than the long spines of the Hair Palm.

The **Australian Fan Palm** *(Livistona australia)* will grow to a height of eighty feet under ideal conditions. The *Livistonas* are sometimes mistaken for Corypha Palms when young because at this stage the two types have much similarity. The Australian Fan Palm is a slow-growing species which does best if partially shaded.

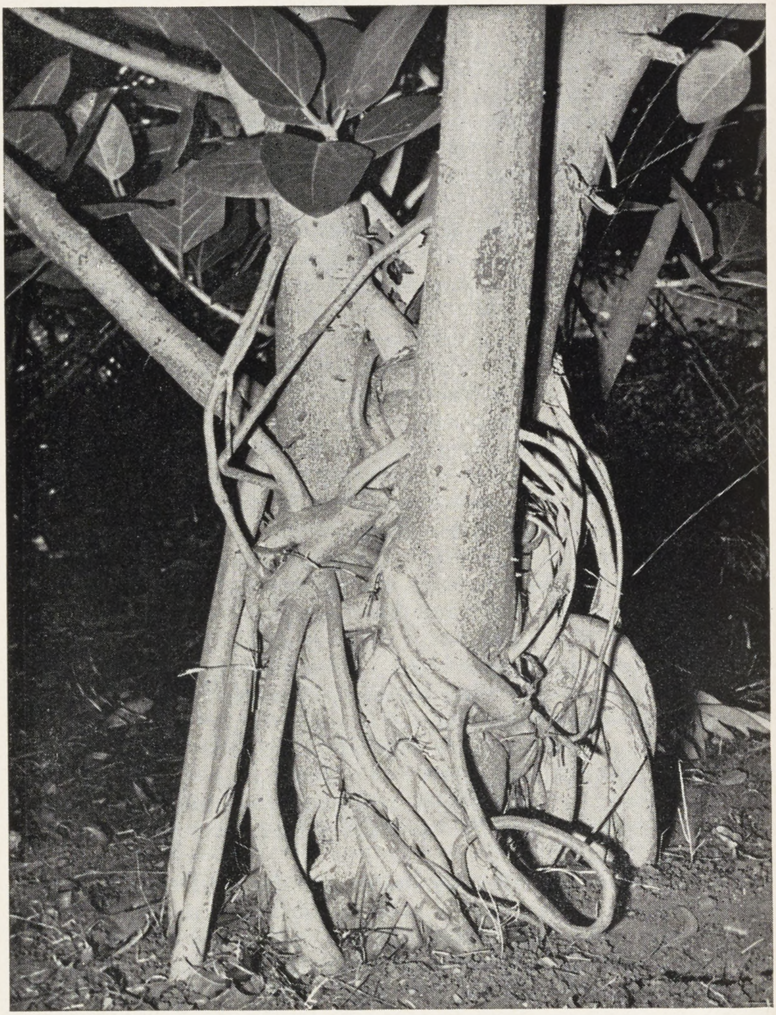
West of the Snake House we have a few **Guadalupe Palms** *(Erythea armata)* which were so named because they are found in a wild state only on the Island of Guadalupe off Lower California. Under favorable conditions these palms develop into large trees very rapidly. In gardens in Santa Barbara they attained the height of twenty feet in a very few years. They require a rich soil and a generous supply of water to grow fast but will exist for a long time under very arid conditions.

The low, reed-like **Raphis Palms** *(Raphis excelsa)* are native to China. The trunks are ringed in bamboo fashion and they form clumps similar to bamboo. The trunks are often used in the manufacture of canes in China. These grow to specimens of real beauty when well sheltered, even in this climate.

FLOWERING TREES

One of the most interesting flowering trees on the grounds is the **Pink Ball** *(Dombeya Wallichii)* with its grape-like leaves and pendant balls of pink flowers which droop from the twigs during the months of January, February, and March. It is native to East Africa and Madagascar and is becoming quite popular in the southern parts of this country. It will not withstand heavy frosts.

The **Jacaranda** *(Jacaranda acutifolia)* is outstanding because of its



BANYAN TREE *(Ficus benghalensis)*

fine, almost fern-like foliage and its blue flowers that appear in midsummer. It ranks among the best flowering trees for subtropical plantings. The heaviest planting of the Jacaranda is in the Fern Canyon where it mingles well with tree ferns and other foliage. It is deciduous, shedding the leaves in late winter or early spring.

Two species of the **Orchid Tree** or **Mountain Ebony** are found in a dense clump near the main gate: the *Bauhinia purpurea* with its red flowers and *Bauhinia variegata* with its purple flowers and very long seed-pods. These trees, native to India and China, belong to the Pea family and are not true orchids.

The south and west slopes of the canyon behind the Wegeforth Bowl have been extensively planted with **Flowering Peach** *(Prunus persica)*. These trees are now attaining large size and make a beautiful display during the spring months. This tree is merely a variety of the commercial peach which was originally found only in China but is now planted throughout the world.

One of the most delicately flowered trees on the grounds is the **Cape Chestnut** *(Calodendrum capensis)* of South Africa. The light lilac-rose, long-petaled flowers are spotted with purple dots. This tree is an evergreen with very dark green leaves.

The **Bull Bay** or **Southern Magnolia** *(Magnolia grandiflora)* is highly prized in the southern states to which it is native. It reaches magnificent proportions in Southern California. The heavy fragrance of its large, white flowers in June is well known by those who live in this area. The Magnolia is widespread in semi-tropical areas in both hemispheres.

One of the most striking of the flowering trees is the **Coral Tree.** We have two species on the grounds. The **Cockscomb Coral Tree** *(Erythrina cristi-galli)* is a small tree from Brazil with crimson flowers that will withstand some frost. Its flowering branches die back after blooming. The **Coral Tree** *(Erythrina indica)* is a large tree from India and Malay with bright red flowers. This tree is used for many purposes by the natives. The flowers are dried and then boiled to yield red dyes; the bark is used for tanning and dyeing; the wood is open-grained and light, but will not split or warp, so it is used for boxes, toys, etc. All species of this genus are deciduous and bloom before the leaves appear. One of the species under the name of *Immortelles* is grown in Brazil to shade the cocoa and coffee trees. It has the added attraction of having very tasty buds and flowers which are considered a delicacy by the natives. The seeds are also used to make into necklaces.

The **Palo Verde** *(Circidium floridum)* is a hardy, evergreen tree native to the arid southwestern deserts. The drooping growth habit and unusual foliage make this tree very ornamental. It is used in the zoo as a shade tree for animals that require only slight protection from the sun. It makes a tree of about 30 feet in height armed with short, sharp spines and narrow leaves about a foot long. Numerous fragrant, yellow flowers are borne in early spring.

The **Common Catalpa** *(Catalpa bignonioides)*, near the top of "F" Canyon, is native to the southeastern states. It is sometimes known as the Indian Bean because the pods, seeds, and bark were used by the Indians for medicinal purposes. The wood is very durable underground and is used for fence posts and railroad ties. This tree has quite large leaves that fall in winter and leave very large leaf-scars on the branches. The flowers are white and very fragrant.

Lagunaria Patersonii has no accepted common name. It is an evergreen tree native to the South Pacific Isles and Australia with flowers that are similar to the Hibisci and hollyhocks. In California it attains the height of 50 feet with a symmetrical, pyramidal head and a fine display of flowers. It is said to be well adapted to street planting.

Yellow Elder *(Stenolobium stans)* of Tropical America is a small tree which is one of our showiest subjects in summer and early fall when the fragrant, golden yellow flowers appear. It is also known as Yellow Bignonia.

SHADE TREES

The **Figs** *(Ficus)* are members of the mulberry family. In this genus the plants all have milky sap and produce fruit resembling the common fig.

The **Common Fig** *(Ficus carica)* has been cultivated since the earliest recorded time. It apparently originated in Arabia but spread very early into the entire Mediterranean area. Now it is cultivated in all tropical and semitropical areas of the world. Almost 800 varieties are known.

Very different from the Common Fig is the **Banyan Tree** *(Ficus benghalensis)* of India. This tree grows to the height of 80 feet and sends down roots from the branches which form secondary trunks and cause the tree to spread indefinitely. One tree in eastern India covers nearly four acres. (Only one tree on grounds.)

Also of India, the **India Rubber Plant** *(Ficus elastica)* is quite common on the grounds and is greatly prized as an ornamental tree in tropical and subtropical areas of the world. This tree requires a hot climate and much water. It is characterized by the huge buttress of prop roots which sometimes become 15 feet in diameter. It has been used as a source of natural rubber, which is made from the latex tapped from the trunks, branches, and prop roots, but it is of a low grade and has no real commercial value. The main source of 90 to 95% of commercial rubber is the **Para Rubber Tree** *(Hevea brasiliensis)*, native to Southern America and a member of the Spurge family.

The **Morton Bay Fig** *(Ficus macrophylla)* of Australia, according to F. von Mueller, is perhaps the grandest of Australian avenue trees. It is very resistant to frost.

A large majority of the trees on the grounds are the Eucalypti. Due to the fact that all of these species are rather similar, it is not felt that

EUCALYPTUS TREE *(Eucalyptus* sp.)

a complete description of each type is necessary. Because the Eucalyptus trees cross-pollinate readily, many of the trees on the grounds are hybrids and cannot be identified.

Most species of Eucalypti are native to Australia where they are valuable as hard-wood timber trees and as pasturage for bees. At one time they were introduced into California in large numbers for their lumber but the venture was not a commercial success. Those species in the zoo which have been definitely identified are:

E. bicostata
E. cordata
E. cornuta, **Yate Tree**
E. corynocalyx, **Sugar Gum**
E. crebra, **Narrow Leaf Ironbark**
E. ficifolis, **Crimson Flowered Eucalyptus**
E. globulus, **Blue Gum**
E. hemiphloia, **Australian Grey Gum**
E. lehmanni, **Bushy Yate**
E. melliodora, **Honey Scented Gum**
E. polyanthemas, **Red Box or Australian Beech**
E. punctata, **Leather Jacket or Hickory Gum**
E. resinifera, **Red Mahogany**
E. tereticornis, **Forest Grey Gum**
E. robusta, **Swamp Mahogany**
E. rostrata, **Red Gum**
E. sideroxylon, **Red Iron Bark**
E. macrorybncha, **Victoria Stringy Bark**

A tree very similar to the Eucalypti and belonging to the same family is the **Brisbane Box** *(Tristania conferta)* of Australia.

In the picnic grounds near the Main Entrance **California Sycamores** *(Platanus racemosa)* have been alternated with **Golden Rain** *(Koelreuteria bipinnata)*. Golden Rain is a native of China and Japan and even though it is deciduous it cannot stand severe frost and will not survive very far north.

Among trees grown commercially in Southern California there are some which make desirable park trees: The **Loquat** *(Eriobotrya japonica)* of China, grown both as an ornamental and also for its edible fruit; the **Avocado** *(Persea americana)* of Tropical America which is widely planted commercially in this area; and the **White Sapota** *(Casimiroa edulis)*, not so well known but growing in popularity, are all represented in the zoo. The creamy white pulp of the smooth, yellowish-green fruit of the Sapota is delicious.

The **Avocado** *(Persea americana)* is a small tree native to Mexico and South America and has been grown extensively in Central America and the West Indies for many years. The brownish-green, pear-shaped fruit is really a one-seeded berry. The pulp surrounding the large seed has a buttery consistency and contains 30% fat, considerable carbohydrate material, and more proteins than any other fruit. The vitamin content is also high.

We have only one type of Elm on the grounds. It is the **Dwarf Elm** *(Ulmus pumila)* of North China to Turkestan. It is a fast-growing, wide-spreading tree which is most ornamental and satisfactory.

The commercially important **Cork Oak** *(Quercus suber)* thrives almost as well in this climate as it does in its native Northern Africa and may some day be grown commercially in this area. The **California Coast** or **Live Oak** *(Quercus agrifolia)* is not used as a source of hardwood in this area but is one of the most beautiful of the native trees.

The **Umbrella Tree** *(Melia azedarach* variety *umbracaliformis)* is believed to be native of Asia and Australia, but the first tree recorded was found near the battlefield of San Jacinto, Texas, and some believe this is a definite species native to Texas since there is no record of it being introduced there.

The **Silk Oak Tree** *(Grevillea robusta)*, another import from Australia, is a fast-growing tree, but mostly grown commercially in this area, although in Australia the wood is used for barrel staves and furniture. Like Eucalyptus, it is drought-resistant and very attractive as a shade tree. And during the blooming season it is brilliant with the heavy, golden blossoms.

Very well named is the **Horsetail Tree** *(Casuarina equisetifolia)*, also from Australia. The long, drooping stems with their small leaves very much resemble a horse's tail. It is called "she-oak" in Australia.

The **Pepper Tree** *(Schinus molle)*, native to the American tropics, is very common in Southern California. It is grown in parkways and as lawn specimens throughout the area. More luxuriant in foliage but not nearly so tall nor so popular is the **Brazilian Pepper Tree** *(Schinus terebinthifolius)*. Both are popular for their clusters of brilliant red berries but hated as breeders of scale.

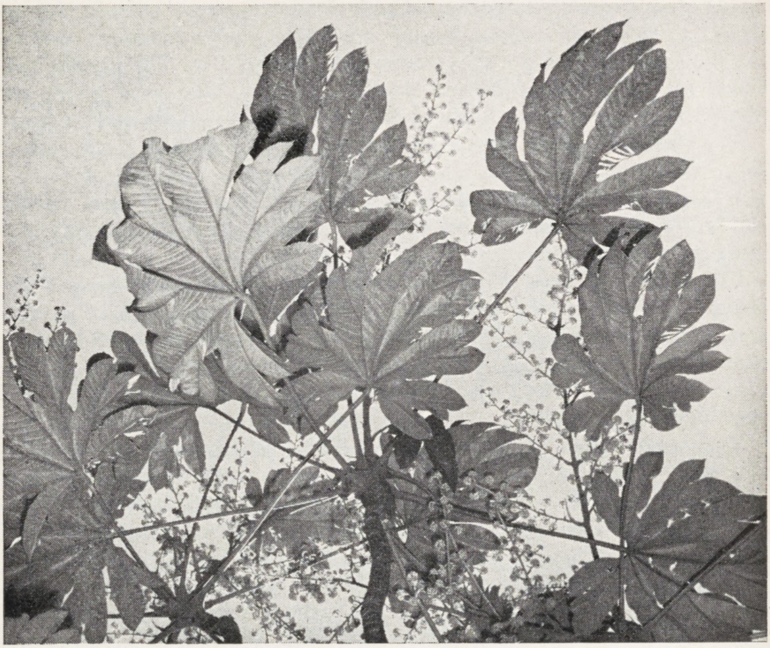
Tree Tobacco *(Nicotiana glauca)*, a yellow-flowered, fast-growing tree native to South America, has become naturalized in all the warm areas of this country and is now considered a nuisance rather than an ornamental or shade tree.

California Walnut *(Juglans californica)* of Southern California is a valuable tree for ornamental use, edible nuts, but not commercially used.

The Acacias are very important in the operation of this zoo inasmuch as they supply daily browse for the giraffes and are enjoyed by all the hoofed animals. All the species we have on the grounds are native to Australia and are not to be confused with the **Camel Thorn** *(Acacia giraffe)*, so relished by wild giraffes. As a rule the acacias are rapid growing and short-lived trees. *Acacia saligna* has small, yellow flowers and small, dark green leaves with leathery texture. *Acacia neriifolia*, **Bald Acacia,** is a large tree with large leaves sometimes five inches long.

In the Stork and Crane canyon there are several **Weeping Willow** *(Salix babylonica)* trees. These are graceful, drooping trees from China with thin-toothed leaves and a soft wood that is of no use commercially. It has been grown in cultivation for many centuries.

Quite common in this area is the **Rice Paper Plant** *(Tetrapanax papyrifera)*, sometimes known as *Fatsia papyrifera*. Being a native of



RICE PAPER PLANT *(Tetrapanax papyrifera)*

Formosa, it was used in the orient as the source of beautiful rice paper which has been prized for centuries. The process of making this paper was a well-kept secret until 1850 when it was discovered by scientists. This plant may be considered a rival of the Castor Bean for producing tropical effects in planting—the leaves are over one foot in diameter and are lobed as are those of the Castor Bean.

The **Sausage Tree** *(Kigelia pinnata)* is one of the sacred trees of tropical Africa. It is planted in semitropical and tropical areas for the novelty of its curious, sausage-shaped fruits suspended from the limbs by long, cord-like stems. The one tree of which the Zoological Garden is able to boast has not as yet produced fruit here but we are still hopeful.

Commercial camphor is made by destructive distillation of the wood of the **Camphor Tree** *(Cinnamomum camphora)*, which comes from China, Japan, and Formosa. It is a large, spreading tree with very dark leaves but is sometimes used for hedges in Florida. Camphor is used mostly for nitrocellulose and cellulose products but is also used for both internal and external medicines.

A very acid fruit, about one inch in diameter, which is sometimes used for pickles and preserves, comes from the **Kei Apple** or **Unkokolo** *(Dovyalis caffra)*. The tree is native to Africa where it grows to a height of 20 feet and is armed with long, stiff thorns. The flowers are of a greenish color.

SHRUBS

The **Nandina** or **Sacred Bamboo** *(Nandina domestica)* is a small, evergreen shrub native to China and Japan. It is held in great reverence in China and is included in every little garden in Japan. Grown as an ornamental this shrub sometimes reaches the height of eight feet. Its showy heads of white flowers produce red berries that stay through the winter. The Nandina is a slow-growing plant which does well in the shade.

One of our most popular ornamental shrubs is the **Honeysuckle.** The *Lonicera implexa* species with its yellowish-white, fragrant flowers is native to Southern Europe and North Africa. Honeysuckles are easy to cultivate and are long-lived, climbing shrubs. The favorite honeysuckle for trellises and verandas in this area is the evergreen **Cape Honeysuckle** *(Tecomaria capensis)* of South Africa. It is a dense and compact grower, a constant bloomer and very satisfactory for hedges.

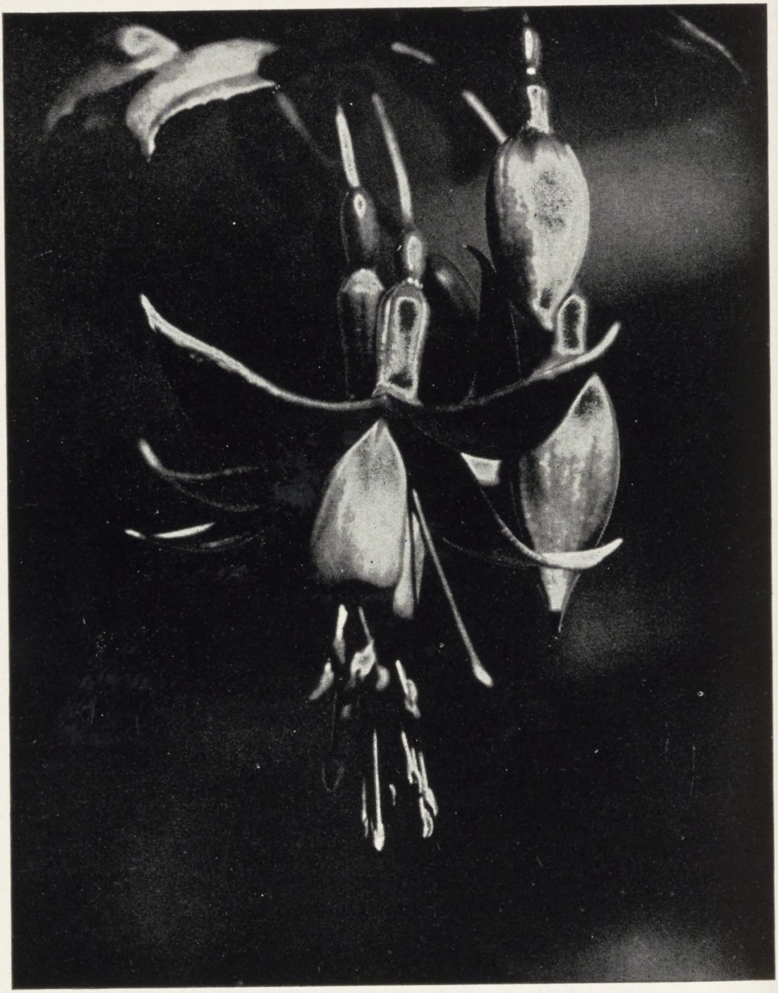
One of the showiest and hardiest of the flowering shrubs is the **Oleander** *(Nerium oleander)* of the Mediterranean area. It has been cultivated as an ornamental for centuries, especially in arid regions. Many cases of poisoning of animals and human beings have been traced to this plant which contains a glucoside similar to digitalis. Either flowers or leaves eaten by small children have taken many of their lives and it is even dangerous to use the Oleander branches as spits for roasting hot-dogs or marshmallows. There are many varieties of this shrub. The flowers range from white to red and are either single or double.

The **Angel's Trumpet** *(Datura arborea)* from the Peruvian Andes is a large shrub with large, white flowers that have green veins. The flowers are sometimes nine inches long. It is much finer than the several species which have become naturalized throughout Southern California or the native *Datura meteloides* common along the highways of Southwestern United States.

The **Blue Potato Vine** *(Solanum rantonnettii)* is a member of the large, so-called nightshade family. It is therefore a close relative of the common potato, *Solanum tuberosum*. It is a native to Paraguay and Argentina where it grows to a height of six feet. It is an excellent plant for park use because of its prolific and continued blooming.

Roseum *(Heterocentron roseum)* is a small shrub from Mexico with square branches. It blooms in late fall or early winter.

Cotoneaster *(Cotoneaster pannosa)* of China is grown chiefly for the ornamental red or black fruits which usually remain through the winter. It is a semi-evergreen with graceful, arched branches.



FUCHSIA *(Fuchsia magellanica)*

Quite common near the top of Fern Canyon is the **Fire Thorn** *(Pyracantha crenulata)*. It is a hardy, spreading shrub from the Himalayan region of Asia with shiny foliage and clusters of dark red or yellow berries in the fall and winter.

Another of the shrubs grown primarily for its berries which remain on the plant through the winter is the **Golden Dewdrop** *(Duranta* *stenostachya).* This shrub has small purple flowers and orange berries. It is native to Brazil.

There are at least two species of the **Rock Roses** on the zoo grounds, the *Cistus crispus,* which is a compact shrub grown for its red or white, hairy flowers, and the *Cistus purpureus,* which is slightly larger than the first, and has purple flowers. Both are native to the Mediterranean area.

The origin of the name, **Cherokee Rose** *(Rosa laivigata),* is obscure since the shrub is native to Japan and China. It is a handsome, high-climbing evergreen rose with slender, green, prickly branches. The flowers which are borne solitary on the branches are very fragrant. The natural flowers are white, but colors varying from pale pink to red have been propagated.

Although usually treated as a shrub or hedge, the **Brush Cherry** *(Eugenia paniculata australis)* forms a very handsome, spreading tree if not pruned. The foliage is dense and glossy, green when mature, tinged with wine-red on the gracefully spreading young shoots. The edible fruits are deep red in color and pleasing to the taste, especially of animals. They are also used for jelly in Australia, its native land.

The **Bird of Paradise** *(Poinciana gilliesii)* is a small and very dainty tree or large shrub native to South America. It has fine, divided leaves and large, yellow flowers which contain long, bright red stamens. The pinnate leaves as well as the seed-pods with their flat, bean-like seeds mark it as one of the family of legumes.

Glossy Abelia *(Abelia grandiflora)* of China is a low, half-evergreen shrub with pink-flushed white flowers. It is a hybrid between *Abelia chinensis* and *Abelia uniflora.* This Abelia is one of the hardiest and most free-flowering and is extensively cultivated for parks and gardens.

There are at least three types of the **"California" Privet** *(Ligustrum ovalifolium),* native to Japan, on the grounds; the solid green Privet and two variegated forms. It is a very handsome, glossy-leaved shrub of stiff habit, which makes it well adapted and much used for hedges.

The **Jewelflower** *(Grevillea thelemanniana)* is native to Western Australia. It is cultivated in this area mainly for its fine ornamental foliage and clusters of small, red flowers.

A Mexican shrub, the **Cluster Flower** *(Cestrum elegans)* is a valuable, medium-sized shrub which blooms almost continuously and has red berries. The flowers are small and of a red-purple color.

One of our finest shrubs for hedge and formal planting is the **Oriental Pittosporum** *(Pittosporum tobira)* of China and Japan. Is is rather showy in growth, having thick, dark green, shiny leaves which are arranged around the stem in rosette form, giving a very unusual appearance. The flowers are creamy white, very fragrant, in dense terminal heads.

The **Victorian Box** or **Mock Orange** *(Pittosporum unlulatum)* of Australia is usually treated as a shrub but, if not pruned, it will attain

ABYSSINIAN BANANA ***(Musa ensete)***

the height of forty feet or more. The flowers have the very heavy fragrance of orange blossoms. The fruit resembles a miniature orange.

Primrose Jasmine *(Jasminum primulinum)* is an evergreen shrub native to Yunnan, China. The flowers, yellow with a darker center, appear in early spring and have very little fragrance.

Scattered down through Fern Canyon we have two types of **Fuchsia or Ladies Ear Drops.** *Fuchsia hybrida* is a hybrid between *F. magellanica* and *F. fulgens* with drooping flowers that have a pink calyx and purple petals. *Fuchsia magellanica,* native to Brazil, grows to a height of 20 feet and is sometimes used for covering walls and fences. The flowers are long and narrow, of a deep red color.

Cape Leadwort *(Plumbago capensis)* of South America is used extensively for hedges in warm climates. The foliage is light green, in clusters along the stem. The flowers are varying shades of light blue.

The **Poinsettia** *(Euphorbia pulcherrima)* is found in abundance on the zoo grounds. It is a tropical plant from Mexico and is extensively cultivated throughout the county, both commercially and for beautifying public and private areas. The large, rich red floral bracts have become the universal Christmas flower.

Lantana *(Lantana camara)* is an excellent plant for mass planting for color effect. It is native to Mexico but is now common in all the subtropical and tropical areas of the world. Introduced into Hawaii, it has thrived so well that it is now a noxious weed. There are several varieties of Lantana. The most common type is the one whose flowers open yellow or pink and change to orange or scarlet with maturity. We also have the Mer Juane variety which bears only yellow flowers which do not change color with maturity. **Trailing Lantana** *(Lantana sellowiana)* is found near the rodent cages on C mesa. It is a free-blooming, low-trailing plant with dainty lavender flowers, hairy branches, and is popular as a ground cover or cover for walls of gardens. It is native to South America.

Australian Tea *(Leptospermum laevigatum)* is a large shrub from Australia with a gnarled trunk and fine foliage. It blooms profusely during the spring and early summer. It is grown only for its ornamental value.

The **Pomegranate** *(Punica granatum)* is native to Persia. It has been cultivated for centuries and spread early to the Mediterranean region and Southern Asia. It was grown in the famous Hanging Gardens of Babylon. It is a bush or low tree with orange-red flowers. The round, reddish fruits have a hard rind and edible pulp with many seeds.

The **Hibiscus** in its many colors and varieties is cultivated extensively in all tropical and semi-tropical areas of the world. The most common species is *H. rosa-sinensis,* but there are hundreds of varieties of which at least 26 are found on the zoo grounds. It is the most striking member of the mallow family with its five-petaled, brilliant flowers and evergreen foliage. The color of the flower varies from a white to deep red. There are many shades of yellow from palest to deep golden or orange and there are both single and double varieties. This is by far the most widely used shrub on the grounds.

The **Dwarf Avocado** *(Persea* sp.) of Central America is a small shrub which bears small fruits about one inch long, shaped like the common Avocado. The pulp surrounding the seed is very thin, making them worthless on the commercial market.

The **Anchor Plant** *(Colletia cruciata)* of Brazil and Uruguay is a very curious shrub. The branches are flattened into triangular spines, each spine at right angles from the one above and below. The tiny white flowers are borne in large clusters at the base of the spines during the spring and are exceedingly fragrant. The round, dark fruits form there later in the year. The leaves are very small and inconspicuous on mature plants.

The **Natal Plum** *(Carissa grandiflora)* is a native of South Africa. The waxy texture of the leaves and the fragrance of the flowers are suggestive of the jasmine. The fruits, borne in the axils of the leaves, occur throughout the year but mostly in the early fall. They are edible and about the size and color of a plum. This shrub is covered with long, branched, sharp spines.

There are several types of **Bottle Brush** on the grounds. The most common are those of the genus *Melaleuca.* The flowers of these shrubs are so arranged around the stem that they resemble the type brush commonly used to clean bottles. Their leaves are thin and long. *Melaleuca longicoma* has red flowers but the variety of color and texture makes the Bottle Brush conspicuous during the blooming season.

OTHER INTERESTING PLANTS

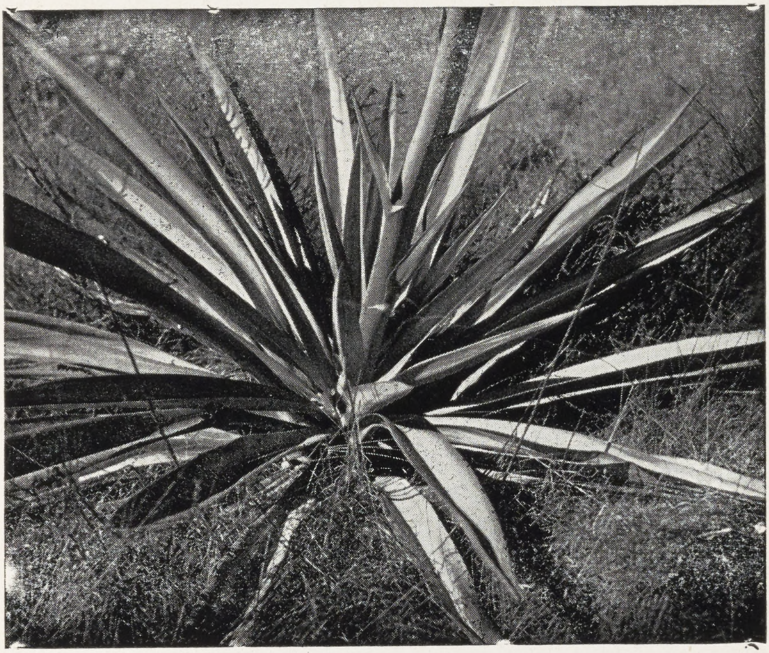
We have four species of the Banana family (Musaceae) on the grounds. The **Common Banana** *(Musa paradisiaca* variety *sapientum)* is found bearing fruit in several locations. From its original home in India it has spread all over the tropical world. After the fruits are borne the plant dies but produces suckers from the old root. These suckers are the only way to propagate the plant because it does not produce seed. In tropical areas they are rapid growers and have a very high yield. The area needed to produce 16 pounds of wheat or 50 pounds of potatoes will yield over a ton of Bananas in the same length of time.

A cousin of the Common Banana is the **Abyssinian Banana** *(Musa ensete)* (near the tiger grotto), which does not bear edible fruit and is, therefore, grown entirely for tropical effect. Native to Abyssinia, this plant grows to a height of 15 feet.

The **Bird of Paradise Flower** *(Strelitzia reginae)* (near small mammal cages) is a small plant with banana-like foliage and flowers that resemble bright blue and orange birds in flight. It is native to South Africa. The *Strelitzia Nicolai* is a much larger plant whose growth resembles the Traveler's Palm. These are also in the banana family.

The **Sago** *(Cycas revoluta)* of Japan is not a palm but a cycad which is closely related to the ferns. It is a slow-growing plant with stiff, fern-like leaves which are borne in a crown at the top of the trunk, making a complete circular mound of green.

The **Ginger Lily** or **Garland Flower** *(Hedychium coronarium)* from tropical Asia is very ornamental both for the dark green leaves and the terminal spikes of pure white, very fragrant, butterfly-shaped flowers.



MEXICAN YUCCA *(Yucca elephantipes)*

Throughout the grounds one will find the **Ice Plant** or **Hottentot Fig** *(Carpobrotus edulis)*. It is a low, trailing plant with triangular fleshy leaves and yellow flowers.

There are several plants on the grounds with yucca-like foliage that are somewhat confusing to most people. The **Yucca** *(Yucca elephantipes)* of Mexico has long, slender leaves which remain on after dying. The flowers are quite large and lily-shaped. The **Dracena** *(Cordyline australis)* of New Zealand has much wider leaves which fall after dying, a slender trunk, and large clusters of very small, lily-like flowers. The **Dragon Tree** *(Dracena draco)* of the Canary Islands has leaves similar to the Dracena but has a very fleshy trunk. **Aloe** *(Aloe humilis)* is a succulent plant with short, fleshy leaves which are armed with blunt spines along their margins. It is native to South Africa. The **Century Plant** *(Agave americana)* is the only one of this group that does not belong to the Lily family. It is easily distinguished by the fleshy leaves with sharp, spiny margins, and has no trunk.

Among the vines on the grounds we have the **English Ivy** *(Hedera helix* var. *marmorata)* from Europe with its variegated leaves and wall-climbing characteristics, the **Japanese Wisteria** *(Wisteria floribunda)* from Japan with its violet-blue, pea-like flowers in clusters and divided leaves, the **Paperflower** *(Bougainvillea spectabilis)* from South America with its bright green foliage and crimson floral bracts, and the **Skyflower** *(Thunbergia grandiflora)* climbing on the fences near the Main Gate and bearing beautiful blue or white flowers during the summer and fall.

Down through Fern Canyon you will find many types of ferns but the outstanding one will be the **Tree Fern** *(Alsophila australis)* from Australia. These ferns are covered with brownish hair and have broad and graceful fronds. They sometimes grow as high as 10 feet.

GRIZZLY BEAR *(Ursus horribilis)*

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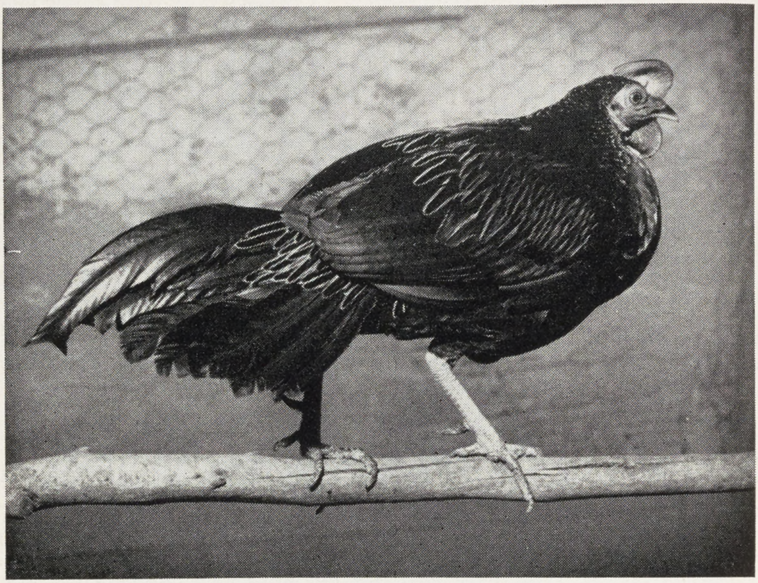
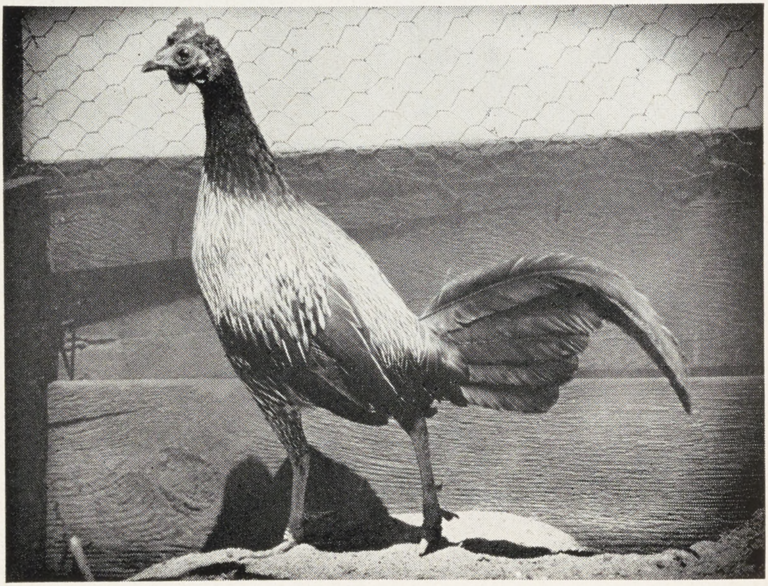


GREEN JUNGLE FOWL *(Gallus varius)*



GRAY JUNGLE FOWL *(Gallus sonneratii)*

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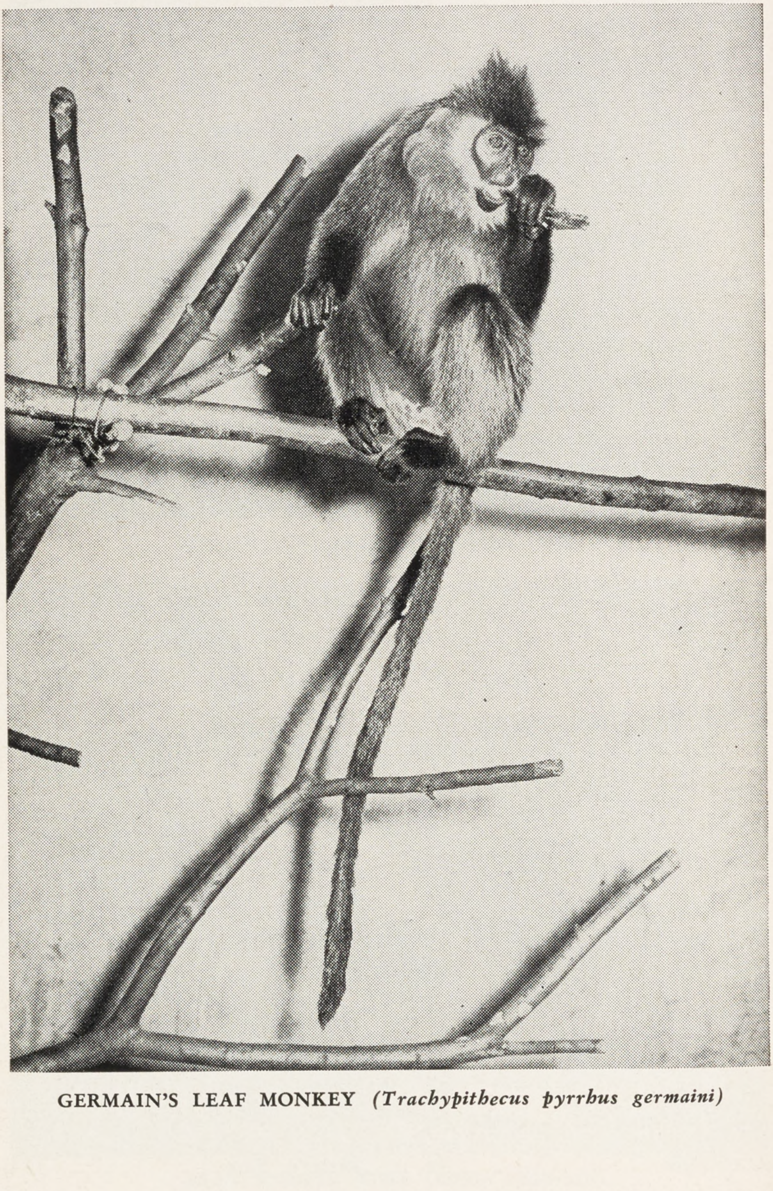

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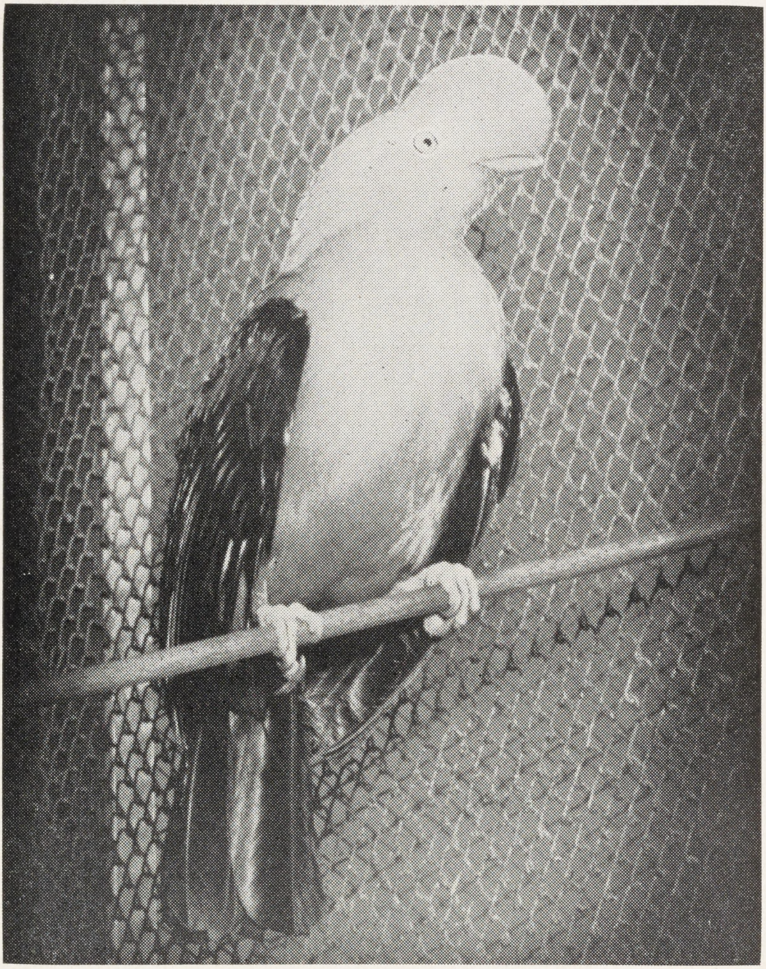

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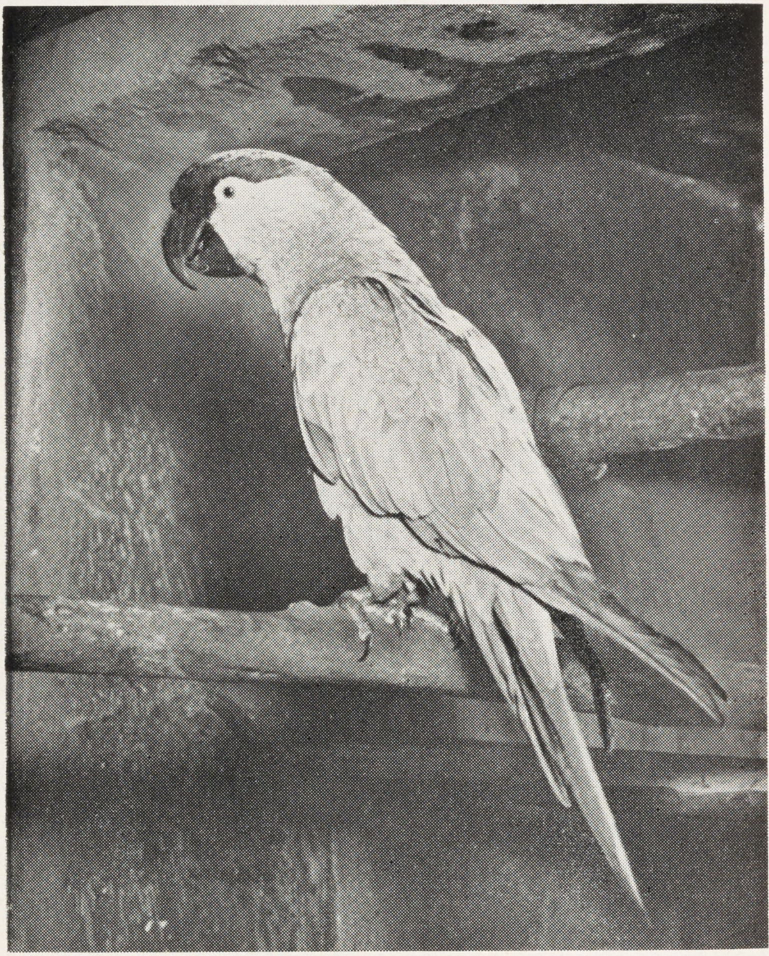

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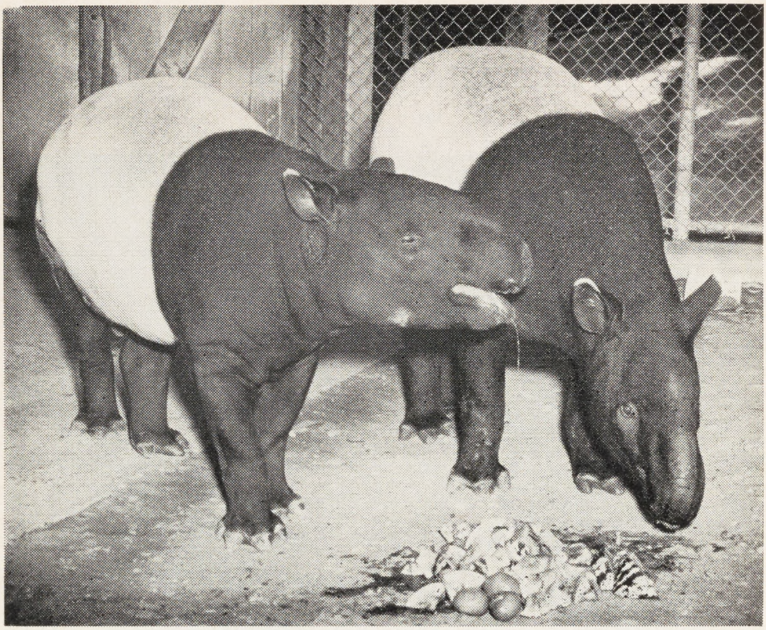
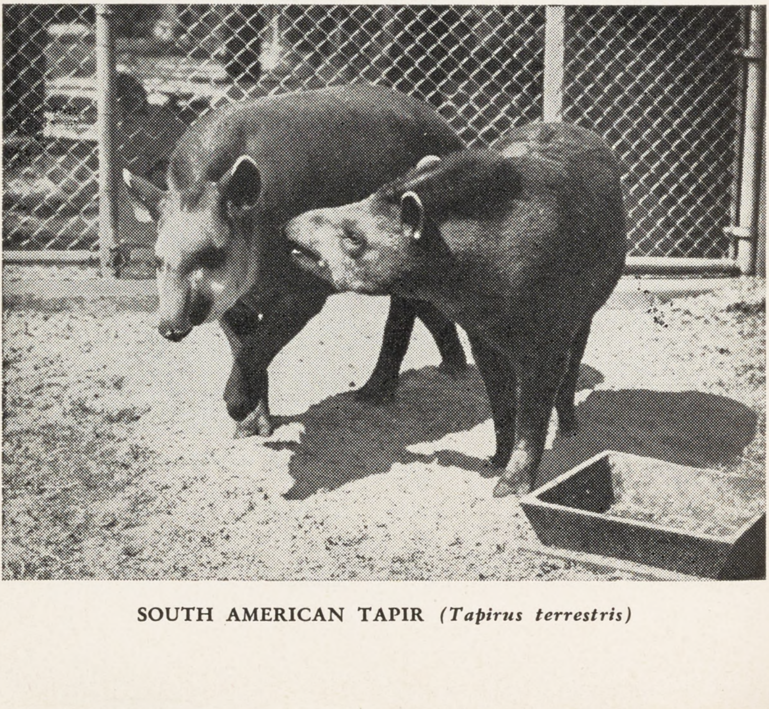


MALAY TAPIR *(Tapirus indicus)*



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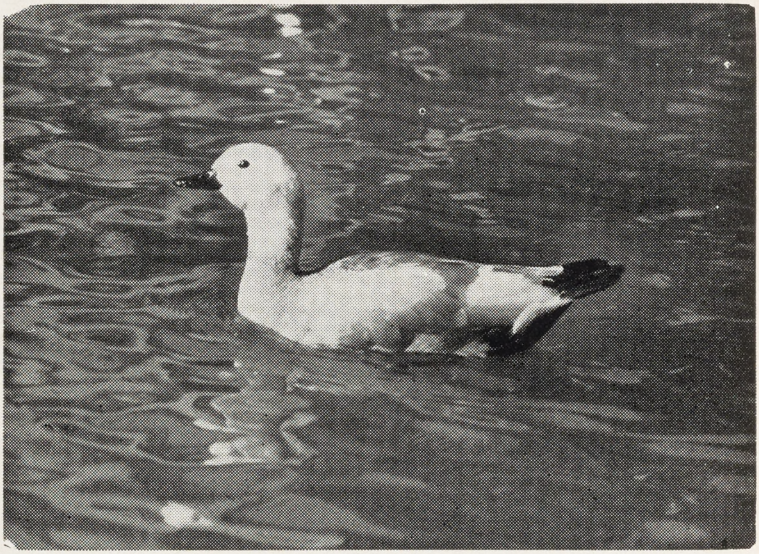

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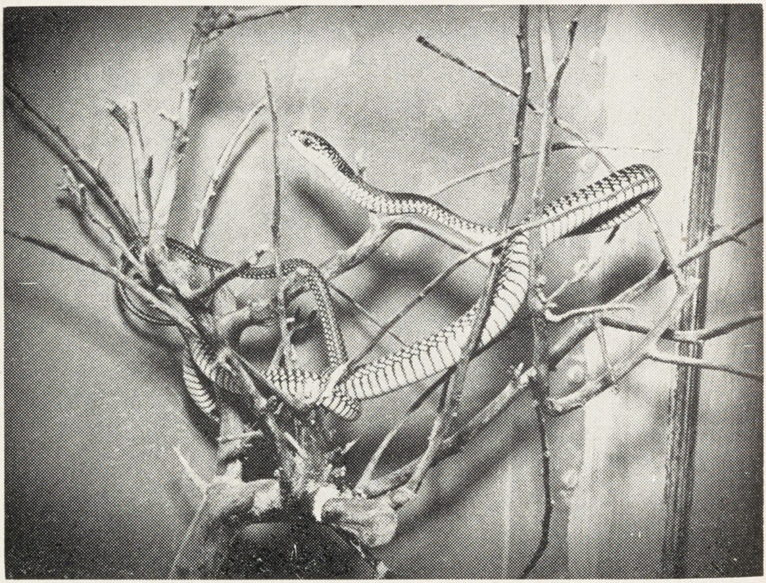

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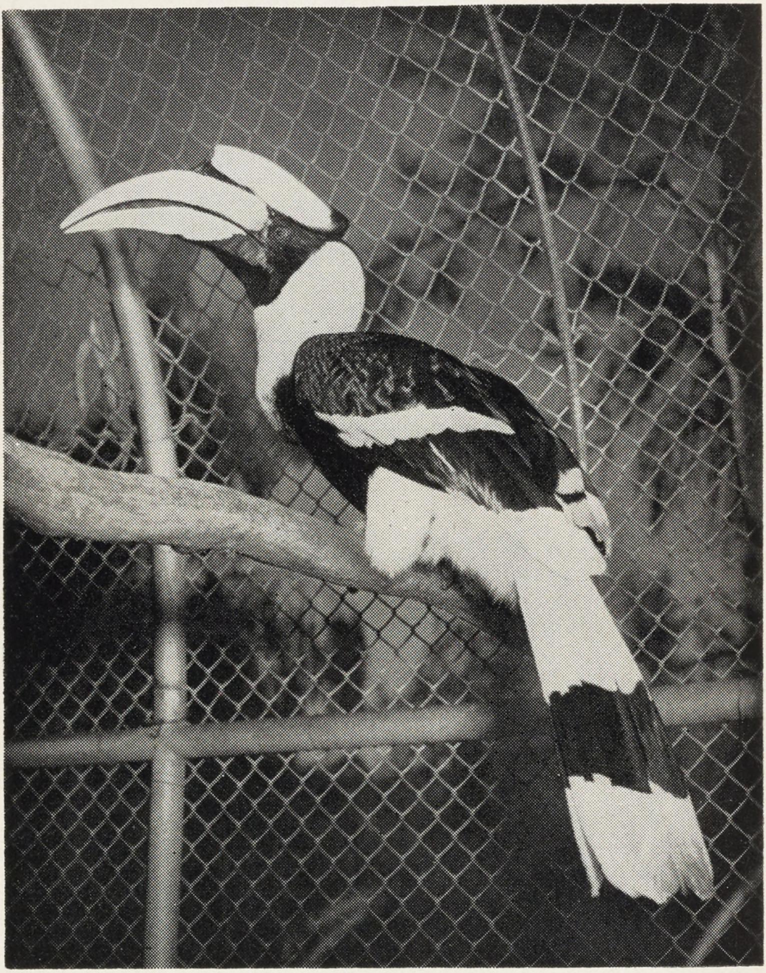

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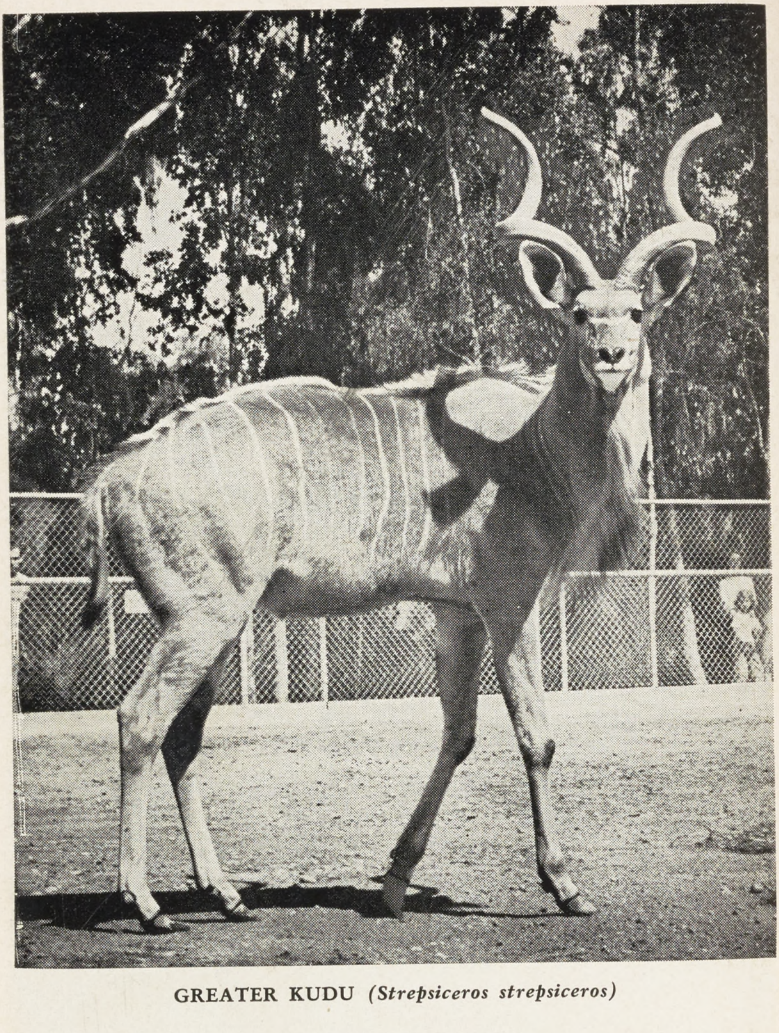
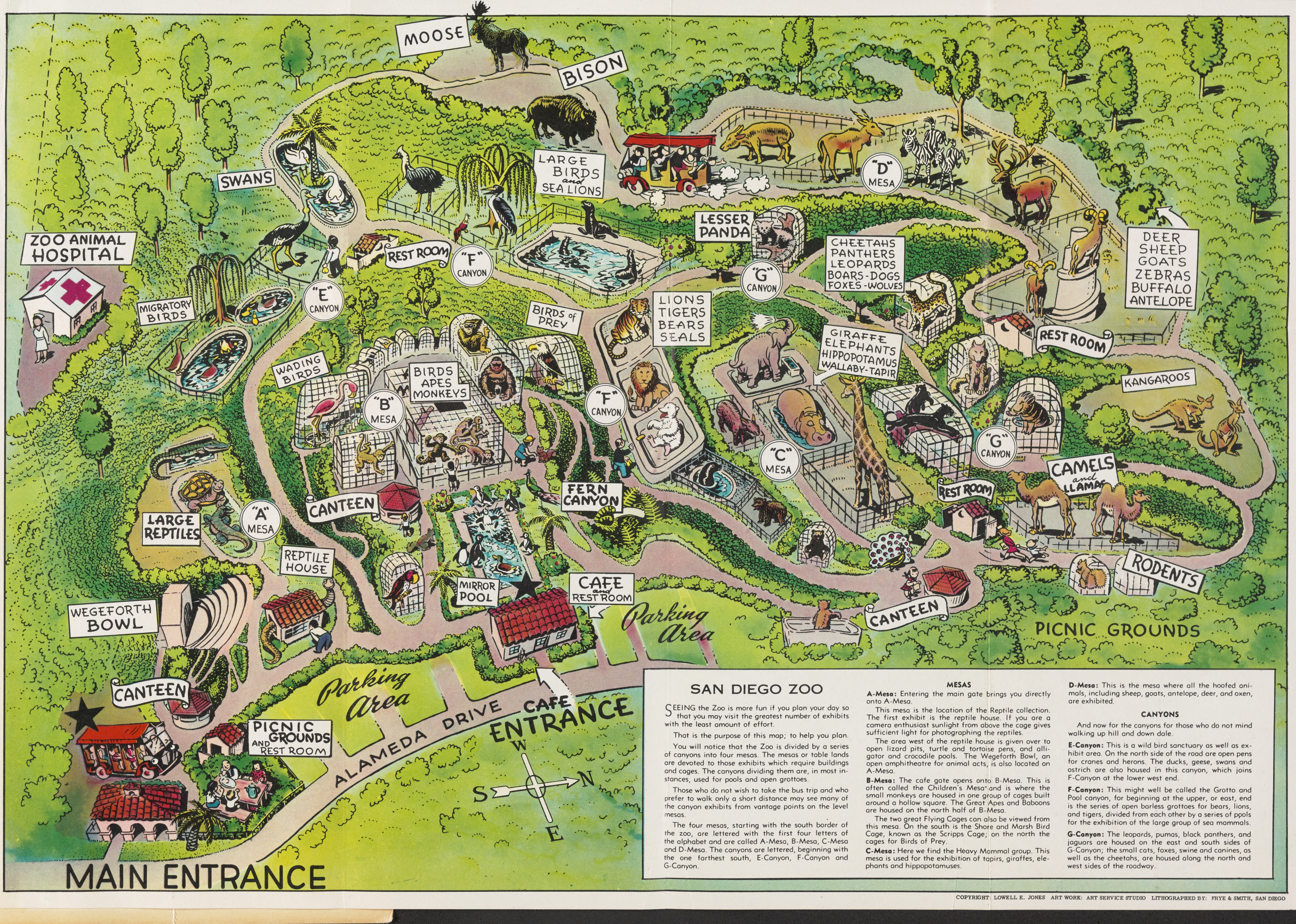
BRONZE-WINGED PARROT *(Pionus chalcopterus)*



GREATER KUDU *(Strepsiceros strepsiceros)*



SAN DIEGO ZOO

SEEING the Zoo is more fun if you plan your day so that you may visit the greatest number of exhibits with the least amount of effort.

That is the purpose of this map; to help you plan.

You will notice that the Zoo is divided by a series of canyons into four mesas. The mesas or table lands are devoted to those exhibits which require buildings and cages. The canyons dividing them are, in most instances, used for pools and open grottoes.

Those who do not wish to take the bus trip and who prefer to walk only a short distance may see many of the canyon exhibits from vantage points on the level mesas.

The four mesas, starting with the south border of the zoo, are lettered with the first four letters of the alphabet and are called A-Mesa, B-Mesa, C-Mesa and D-Mesa. The canyons are lettered, beginning with the one farthest south, E-Canyon, F-Canyon and G-Canyon.

MESAS

A-Mesa: Entering the main gate brings you directly onto A-Mesa.

This mesa is the location of the Reptile collection. The first exhibit is the reptile house. If you are a camera enthusiast sunlight from above the cage gives sufficient light for photographing the reptiles.

The area west of the reptile house is given over to open lizard pits, turtle and tortoise pens, and alligator and crocodile pools. The Wegeforth Bowl, an open amphitheatre for animal acts, is also located on A-Mesa.

B-Mesa: The cafe gate opens onto B-Mesa. This is often called the Children's Mesa and is where the small monkeys are housed in one group of cages built around a hollow square. The Great Apes and Baboons are housed on the north half of B-Mesa.

The two great Flying Cages can also be viewed from this mesa. On the south is the Shore and Marsh Bird Cage, known as the Scripps Cage; on the north the cages for Birds of Prey.

C-Mesa: Here we find the Heavy Mammal group. This mesa is used for the exhibition of tapirs, giraffes, elephants and hippopotamuses.

D-Mesa: This is the mesa where all the hoofed animals, including sheep, goats, antelope, deer, and oxen, are exhibited.

CANYONS

And now for the canyons for those who do not mind walking up hill and down dale.

E-Canyon: This is a wild bird sanctuary as well as exhibit area. On the north side of the road are open pens for cranes and herons. The ducks, geese, swans and ostrich are also housed in this canyon, which joins F-Canyon at the lower west end.

F-Canyon: This might well be called the Grotto and Pool canyon, for beginning at the upper, or east, end is the series of open barless grottoes for bears, lions, and tigers, divided from each other by a series of pools for the exhibition of the large group of sea mammals.

G-Canyon: The leopards, pumas, black panthers, and jaguars are housed on the east and south sides of G-Canyon; the small cats, foxes, swine and canines, as well as the cheetahs, are housed along the north and west sides of the roadway.

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